Telephony.

THE AMERICAN TELEPHONE JOURNAL

Comprising Telephony, American Telephone Journal, Sound Waves, Telephone Magazine and The Telephone

Vol. XIX CHICAGO, SATURDAY, APRIL 23, 1910 No. 17

PUBLISHED EVERY SATURDAY BY THE

Telephony Publishing Company

Monadnock Block, Chicago

H. B. McMeal, President F. S. Kenfield, 1st Vice-President
W. H. Graffis, 2d Vice-President H. D. Fargo, Secretary-Treasurer

Edited by H. B. McMeal and Franklin H. Reed

Associate Editor, Stanley R. Edwards

Contributing Editors

Max W. Zabel, Patent Dept. J. C. Kelsey, Financial Dept.
A. H. McMillan, Legal Dept. A. B. Smith, Technical Dept.

The present publication comprises: The Telephone, Telephone Magazine, Sound Waves, American Telephone Journal and
Vol. 19 Telephone No. 17

TERMS OF SUBSCRIPTION:

United States, Cuba and Mexico.....per year, $3.00
Canada 4.00
Other Foreign Countries within the Postal Union..... 5.00

NOTICE TO ADVERTISERS

Changes of advertising copy should reach the office ten days in advance of date of issue. New advertisements accepted up to noon of Thursday for the paper dated Saturday of the same week.

Entered as second-class matter September 4, 1908, at the post office at Chicago, Ill., under act of March 3, 1879.

CHICAGO, ILL., SATURDAY, APRIL 23, 1910.

CONTENTS.

Editorial 497
Independent Telephony in the West. By W. J. Stadelman....499
The Elson Bill Defeated.....500
Ohio's Repudiation of Monopoly. By Frank H. Woods.....500
Hints on Constructing a Cable System (Concluded). By Robert J. Ardiff 501
The Licensee Minority Stockholder. By J. C. Kelsey.....503
Matters of Practical Interest.....506, 507
Depreciation. By Major W. A. J. O'Meara.....508
The British Channel Loaded Cable.....512
From the Legal Viewpoint. By A. H. McMillan.....514
A Two-Battery Two-Circuit Arrangement and Its Application. By Arthur Bessey Smith.....515
Among the Companies.....517, 518, 519
Work of the Inventors. By Max W. Zabel.....520
Factory and Sales.....521, 522
Condensed News Reports.....523, 524

Ohio Furnishes a Lesson to New York.

Absolute proof that Ohio wants competition in the telephone business came in the decisive defeat of the Elson bill. Unorganized public sentiment has overcome one of the strongest organized movements to pass a bill through a legislature which has ever been attempted by corporate interests.

Ohio has had telephone monopoly. She has had telephone competition. And she knows better than any other state in the country just how much of a nuisance is the dual telephone system, and just what are its benefits, and why it is worth having.

The New York bill to put telephone companies under the public service commission is in most respects a good bill. It is wrong and injurious in leaving open an avenue by which mergers can be effected through the sanction of the commission, and means by which the extension of beneficial competition in the telephone industry will be hampered.

New York has an object lesson in the action of the Ohio Senate.

The Trouble Caused by Overcapitalization.

The minority stockholder is interesting the New York Public Service Commission. This body has powers over all public utility corporations except the telephone companies; and it will have authority over them if a bill now before the legislature is passed.

The great objector to watered stock has usually been the non-investor in the securities of public service corporations. His kick is on rates, and "strap hanging."

According to Commissioner F. W. Stevens, the New York regulative body has found that this anxiety is unfounded as far as it has been directed at rates. The evils of overcapitalization have rather been poor service, and depreciation of securities. The consumer has only suffered through his sensitory nerves, while the investor alone has been tormented at the base of the pocketbook nerve.

Rates run about the same, no matter what the ratio of "liquid assets" to plant value. Undoubtedly competition, or the fear of it, is the cause of this.

Where ultimate success depends upon a policy of keeping up service and expanding the plant and organization to meet the public demand for good service, it would seem that a fair working rule of thumb would be "Protect the

minority stockholders." No private fortune, for example, can keep pace with the growth demanded of a telephone company. Outside capital must be drawn in, in a large aggregate of comparatively small individual investments after the initial construction period. This means that there can be no permanent success for a public utility that does not pay dividends.

The Use of a Portable Telephone for Railroad Locating Engineers.

In a recent number of a railway engineering paper, a description was given of construction work on the Western Pacific Railway. The article was accompanied by illustrations among which were views showing difficulties encountered in the surveying and laying out of the road through the Feather River Canon. In these views, the men were shown in places extremely difficult of access, in some cases being lowered from point to point with ropes. In looking over the views, the thought arises that great difficulty must have been encountered by the men in communicating with each other, judging from our experiences in trying to talk in ravines and gorges. Naturally the idea comes up regarding the advisability of a portable telephone for use in cases where it is impossible to get near enough together for intelligible talking. It would appear that the locating engineers of a railroad projected through a rough country would find considerable use for a light, compact, portable telephone. The portable telephone has been thoroughly tried out by the U. S. Army and also foreign governments and is said to be very successful. The use of such a telephone equipment by the railroads in laying out and constructing lines, and by surveyors and contractors in other work, is a field of which the possibilities we believe have not as yet been investigated by telephone manufacturers. Of course, not all railroads in building new lines and extensions pass through such countries as in the case cited. It would seem, however, that a great deal of time, to say nothing of misunderstandings, could be saved were a portable telephone set used for communication between the instrument men and rodmen and others in a surveying party.

In connection with this manufacturers should not overlook the use of the telephone on various kinds of construction work. There is great need of quick communication between the various points on a construction project. In many cases the points are a half mile or more apart, and the only method of communication is by messenger. If the manufacturers should organize a systematic campaign for the purpose of drawing the attention of contractors to the advantages of telephone service on construction jobs, there is no doubt but what there would be greatly increased sales in that field.

A Word of Caution.

In the wide discussion of the advantages of competition in the telephone field, there is one argument which has, in a measure, escaped being given its proper place of importance. The advent of a second company into any portion of the field reduces the risk of "arbitrary" methods in dealing with the public. One company in control of any district will make rules and draw lines circumscribing the privileges of the public, and enforce regulations to its own interest in affairs which cannot be controlled by franchises or ordinances.

There are hundreds of cases where a business is so conducted that it requires special circuits or devices in connection with the telephone service. Where there exists but one company it prefers to design and furnish what it terms "standard" equipment, with which the subscriber must be satisfied. With a second company offering to serve subscribers the term "standard" does not imply a high degree of restriction. There arises at once a desire to give the subscriber a spade if he intelligently asks for a spade, and not insist that a shovel be satisfactory. Thus the "arbitrary" element is removed—the slogan becomes, "Get the business!"

Competing companies, however, frequently make the mistake of rendering special service without extra charge, just to "get ahead of the other fellow."

Yet somebody has to settle the bill some time. It will be found that the American public is generally willing to pay a fair price, if it gets what it wants. It does not care to be the "goat" in a cut-throat battle between two corporations. The telephone user does not appreciate having his complaints of service answered thus: "Oh, well, you're getting it for nothing; you have no kick."

The Center of the System.

The success which is attending individual and united efforts of Independent telephone operators is exceeded only by the enthusiasm which inspires the most remarkable growth which any nation wide industry has experienced. Link by link there is being forged a chain of common interest which binds together the small plants without limiting the individual or collective local stockholders in their rights. Each separate corporation retains unto itself those functions which to it rightfully belong, and still becomes a unit of a great and ever increasing system. The management of a plant accepts or solicits interconnection with that of a neighboring community, town, city or county, if it is considered a wise business proposition. An equitable division of the revenues from toll service is easily arrived at.

The greatest factor in the success of the amalgamation of Independent companies has been the retention of local interests both in ownership and operation. The "little feller," with his all, though it may be but a few thousand dollars, invested in a plant, upon securing connection with a system operating in a metropolitan city, still retains his ownership and the power to exercise his individuality. Whatever financial enhancement the connection may yield is his to share, because the larger operator does not put forth the claim "You are now a part of my system," claim and demand the whole profit.

The experienced operator gives freely to the inexperienced from his store of knowledge, every kernel of which has been threshed and tested in the wide school of experience.

Then it is safe to assert that the "center of the Independent system" may be expressed in one word—co-operation—and may be found everywhere. A suitable slogan for the Independent operators would be "Get together; keep together."

Independent Telephony of the West

Article I—Billings, an Example of Independent Success in Local and Long Distance Business

By W. J. Stadelman

Editor's Note.—Mr. Stadelman, one of the leading Independent telephone men of Nebraska, is making a tour of the principal cities of the Northwest and Pacific Coast. He will visit and inspect Independent plants in the important cities and call upon telephone officials and prominent business men. His letters, giving concise reviews of the situation in each place, will be presented as leading articles in TELEPHONY.

Mr. Stadelman's experience and recognized ability as an organizer, business builder and operating man will lend unusual interest and authority to his statements.

During the trip now under way I am going to give you an outline of the condition of the various Independent telephone properties along my route, which will include the following cities; Billings, Butte, Spokane, Seattle, Portland, San Francisco, Los Angeles, Phoenix, and the country tributary thereto.

I shall endeavor to confine myself as closely as possible to the physical conditions, methods of operation, territory covered, and the prospects for future growth of the plants. I will make each report as brief and concise as I possibly can and still do justice to the system.

At Billings I find a surprisingly well equipped and well managed reconstructed automatic plant. When I say reconstructed I mean a property that was formerly a common battery manual system. And, by the way, here is a living example to prove that automatic equipment can be maintained and operated successfully with an open wire system, as this plant has at present only a limited amount of cable. Conditions, however, are to be improved shortly, as the city contemplates paving. When the paving question is fully and finally settled, the plans and specifications now pending for an all cable system will be carried out. There will then be a very extensive underground system in the down-town or business district.

The Billings Mutual Telephone Co. owns its central office building. It is a modern, complete, stone front structure located in the heart of the city, interior furnishings are up to date in every respect. For the public's convenience there is a large, well arranged waiting room containing four roomy, well ventilated booths, with the cashier's office and manager's office easily accessible.

The local subscribers within the corporate limits number 1,150. Added to these are about 1,000 switching and farm line subscribers, making a total directly connected with the plant of 2,150. The Bell system has a total of not more than 1,000 subscribers in the same territory.

The points reached by the Independent long distance connections cover the following territory, the towns that are marked with (*) indicating exchanges:

*Anaconda, Absarokee, Valentine, Basin, *Big Timber, *Billings, *Bozeman, Boulder, *Bear Creek, *Belfry, Belgrade, *Bridger, *Butte, Cable, Central Park, *Deer Lodge, Chance, Chico, Chimney Rock, Coalville, *Columbus, Corbin, Clancy, Dean, Dog Creek, Electric, Fish Tail, Fridley, *Fromberg, Forest Grove, Flat Willow, Gardner, *Great Falls, Gregson Springs, Grass Range, *Helena, *Huntley, *Hunters Hot Springs, *Joliet, Jefferson City, Jefferson Island, Kendall, *Laurel, Lavina, *Livingstown, *Livingston, Logan, Manhattan, Merritt, Milner, Moore, Melstone, *Musselshell, Nye, Osborne, Park City, Pipestone Springs, Pompeys Pillar, *Red Lodge, Roberts, Ralston, Rock Vale, *Roundup, Sappington, Salesville, Silver Bow, Salesia, Stewart, Springdale, Thirty Mile, Trident, *Three Forks, Willow Creek, Wisdom, Wolf Springs, Warm Springs, Whitehall.

The Montana Mutual is not only doing the larger percentage of the local business, but practically all of the long distance. The service rendered is absolutely satisfactory to the subscribers. I made personal inquiry to settle this point, and found that, out of 22 business houses visited, 17 recommended very highly the service, four were indifferent and expressed no preference; one, however, was not satisfied. The favorable reports of my inquiry are remarkable, especially on account of the places visited, including hotels, cafes, cigar stores, news stands, all being exceptionally busy places. I would not, however, have confined myself to the particular branches of business named, but my time was limited and the day was Sunday.

The automatic service at Billings was cut over from manual in October, 1908. When this service was inaugurated the rates were raised to the following: Business, unlimited service, $5 per month; business, party line service, $4 per month; residence, unlimited, $3 per month; and residence party line service $2 per month. These rates are higher than the Bell rate. With this condition existing, the Independent company has twice as many subscribers as its competitor, and 300 new subscribers have been added to its list since the inauguration of the higher rate.

Wages are seemingly high, on account of everything being controlled by union labor. Operators receive from $50 to $60 per month, linemen from $3.75 to $4.50 per day of eight hours work.

There is no state telephone organization in Montana. The majority of the Independent plants throughout the State are owned by practically three companies, this possibly, furnishing a reason for the lack of a formal organization. The companies operating, cover practically all of the principal points, and they have working agreements with the smaller companies which operate in the interior, or which own farm lines. It would be a great help to the rural companies if there were a state organization, if for no other purpose than to receive the benefits that can be derived from getting together. State organizations simplify the standardizing of accounting, standardizing of equipment, and standardizing of methods of doing business.

They also afford an opportunity to make the acquaintance of fellow operating men by personal contact.

The Billings property is owned principally by Mr. P. B. Moss, a banker residing at Billings, who is heartily "in the game" in every way, and never hesitates to "come through" with funds when necessary to install equipment that will increase the efficiency of the service or satisfy his patrons.

The manager, Mr. J. Nevin Perry, has gained his position by working from the ground up, having served in all branches of the business, and from his able management and courteous treatment his plant is bound to succeed. The next letter will be from Butte.

Elson Bill Defeated

A victory for competition in the Senate closed the bitter fight to jam the Elson bill, permitting mergers of competing telephone companies, through the Ohio legislature.

The bill was defeated late Wednesday, April 20, by a vote of 19 to 14. Every device known to the legislators favoring the monopoly interests had been worked to save the measure. The vote of 19 to 14 against the bill and a still heavier vote against reconsideration, came even after the measure had been amended to prevent long distance mergers, and so this is a conclusive victory for local competition, as well as long distance competition.

One of the devices attempted to save the bill was to put it in its regular place in the new Ohio code, which would have necessitated concurrence by the House. Although the House once passed the bill, it is believed that, as a result of the bribery discussions, it is now in a mood to refuse concurrence.

During the fight in the Senate charges of bribery were freely made against the telephone lobbyists, and on Wednesday it was charged that the Bell company introduced a woman stenographer into the Senate to spy on the senators. Senator Duval intimated that the actions of certain senators indicated that there was collusion between them and the Bell interests, and that this spy was the go-between.

As soon as the vote of 19 to 14 was recorded, showing the decisive victory for the opponents of the bill, some of the wavering politicians recovered their courage. A motion to reconsider was defeated by a vote of 25 to 8.

It is a significant fact that senators from all the larger cities where there is competition voted in opposition to the bill, thus demonstrating that the people of these cities are actively interested in having competition maintained.

Ohio's Repudiation of Monopoly

A Statement Showing the National Significance of Defeat of the Elson Bill in the Ohio Senate

By Frank H. Woods

President, National Independent Telephone Association

The American Telephone & Telegraph Company is making a final gigantic effort to subject the 50,000,000 people who use telephones in 9,000,000 homes in the United States, to the domination of the most vicious trust that ever preyed upon a great nation. Defeated in every prior attempt to drive out competition, it now seeks, by means of pernicious lobbies to force through state legislatures bills repealing the state and anti-trust laws, with a view of using the results as a pretended sanction by state authorities of its criminal violations of the Sherman anti-trust law.

The first great battle has just been fought in Ohio. The defeat of the Elson bill by the Ohio Senate means the preservation intact of the magnificent Independent telephone system in that great commonwealth. It gives reassurance and new courage to the Independent telephone hosts and the people throughout the entire nation.

During this crucial fight, all eyes have been looking to Ohio. The National Association, through its officers, deems it a duty as well as a pleasure to congratulate the Ohio Association upon the fight which it has so ably conducted against great odds and upon the magnificent victory it has achieved against monopoly.

While the importance of the result can hardly be overestimated, the Independents must not be taken off their guard. Careful watch for new bills and "joker" amendments to old ones must be kept. The Bell company seldom fights in the open. Let its every movement be exposed and from now on its defeat is certain.

New Trick in Rebating.

While in places where there is no competiton the public is spending its time and money figuring out how to get rid of being overcharged by the Bell telephone monopoly, that ingenious corporation has representatives sitting up nights, in Nebraska, trying to figure out a way of beating the law against its giving away service. According to charges made before the State Railway Commission last week the Bell company, in order to give rebates and thus cut under a competitor, has offered to pay discounts in the form of a monthly cash payment to a subscriber as a solicitor of the company in order to keep him on the list of patrons. There are still places in the East where the man who wants a telephone has to go around to the company's office and give his family history to a grumpy clerk.

Telephones in Ceylon.

The big island in the Indian Ocean whose name is familiar to every one on account of the extensive advertising of tea which grows there, if for no other reason, is, like other places in the far east, gradually extending its telephone service. According to statistics for 1908, published in the *Journal Telegraphique*, the central office of Colombo had 347 subscribers, a growth of 80 during the year. On the whole island there are 641 telephones. In addition to the regular exchange service the railroads operate 54 telephones.

Hints on Constructing a Cable System*

By Robert J. Ardiff

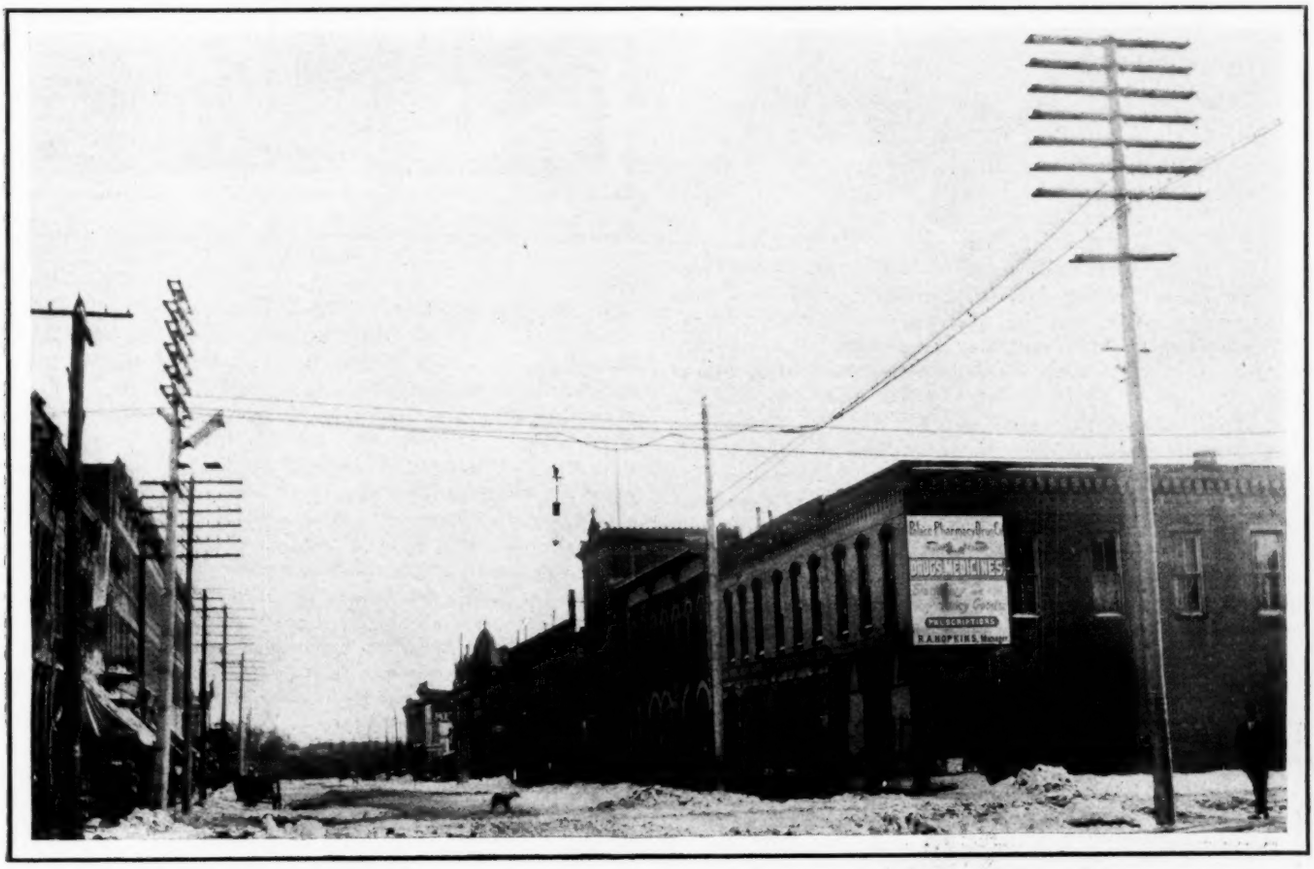
The location of anchors is usually determined by the dividing property lines or streets. Anchors are located as far as possible from street crossings, foot paths, cross walls or driveways in order to minimize the danger from accidents. When possible, the anchor is located at a distance from the pole equal to the height of the guy strand at the pole above the ground. Anchors should never be located nearer the pole than one-third of the height of the pole above the ground.

The length and width of the excavation for an anchor log, when this is used, is made as small as possible, especially at the surface of the ground. All fillings should be firmly tamped and on heavily loaded and important lines the anchors may be set in concrete. The anchor rod is set in a straight line with the guy strand, and extends six inches above the ground and has its eye furnished with a thimble. It passes through a hole in the anchor log slightly larger than its own diameter, and the nuts should be screwed on the threaded end as far as possible.

It may here be remarked that it is not good practice to cut up good poles for anchor logs. Selected second hand ties, cull poles or old poles can always be obtained at reasonable cost.

There are forms of patent anchors on the market which it is advisable to use where the strain is light and the nature of the soil is especially adapted to their installation.

When messenger is strung for carrying cable it may be placed so that it will have a height of 23 ft. above the ground at the points of support, which, when suspended with a strain sufficient to give the required sag of about 15 in. for the first 100 ft. of span length and a gradual increase for each 15 ft. up to 145 ft. of span, which has a sag of 2 ft. 6 in., will provide ample clearance over streets and other highways. In longer spans the point of support must of necessity be at a greater distance from the ground, which height may be readily calculated. Under ordinary circumstances the first cable erected on a pole line should be strung on the street or alley side of the pole. Should the pole line change sides of the street it should be so erected that the longest side will be the street side. Cables should never pass from one side of the pole to the other.



A Case Where the Telephone Company Has an Excellent Opportunity to Do Some Good Cable Work.

Cables are suspended on messenger with respect to their weight and length of span. In ordinary practice, where the spans do not exceed 150 ft., the following is considered good practice:

6,000 lb. strand wire, supporting 15 to 100 pr., 22 gage, and 25 to 50 pr., 19 gage cable.

10,000 lb. strand wire supporting 250 pr., 22 gage, or 100 pr., 19 gage cable.

16,500 lb. strand wire supporting all larger size of cable.

In order to avoid splicing, the messenger is strung in as long lengths as can be conveniently handled. It is found in practice that a continuous length of messenger approximately one mile in length can be handled to advantage. When it becomes necessary to splice a messenger this should be done by interlocking thimbles and passing the end of one strand about each thimble and securing the

*Concluded from issue of April 9, 1910.

strand upon itself with approved clamps. The splice should be located as near a pole as possible, to facilitate in the erection of the cable.

Except in the case of light cable, or where it is not possible to extend the messenger beyond the cable, the messenger should terminate on the first pole beyond the cable. Messenger when secured at a splice or about a pole should be fastened by employing one 3-bolt clamp for 6,000-lb.. strand; two 3-bolt clamps for 10,000-lb. strand, and three 3-bolt clamps for 16,500-lb strand. Strain plates should likewise be employed to prevent injury to the pole by being cut by the messenger.

The cable is attached to the messenger by means of cable hangers, either of metal or marlin. Of these hangers many types are on the market, each claiming certain advantages. If marlin hangers are used they must be of sufficient length so that the effect of the unequal expansion and contraction of the cable and messenger, due to variations of temperature, does not affect the cable itself. These hangers are spaced along the cable in accordance with the weight per foot of the cable, varying from 20 ins. for the smaller cables to 12 inches for 400 pair, 22 gage cable.

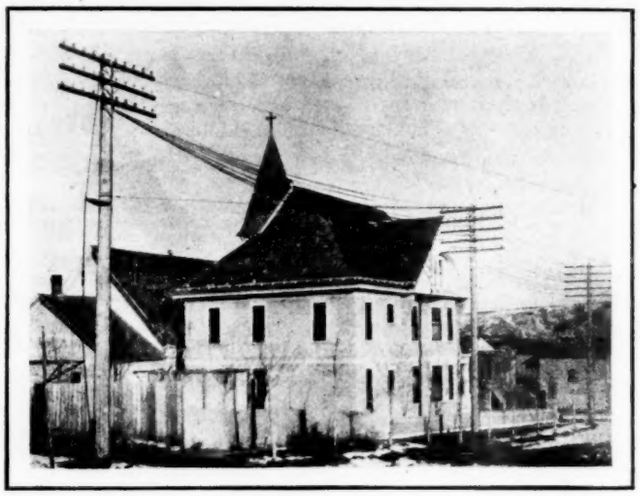
The troubles due to insufficient freedom of action for contraction and expansion between the cable and messenger manifest themselves by frequent cracks and breaks in the cable, allowing the access of moisture. The cracks generally are accompanied by a lumpy appearance of the sheath, and by a tendency for the cable as a whole to assume a wavy form, sometimes in places rising above the supporting strand. Where small amounts of slack have been left in aerial cables at poles (known as pole dips) and the cables elsewhere have not been suspended at a sufficient distance below the span, as described above, these cracks generally appear in the center of the pole dip, and on the upper side of the cable sheath.

A careful study of this condition has resulted in the conclusion that the trouble is due to a longitudinal motion of the cable, resulting from the contraction and expansion with temperature changes. The rate of expansion of lead with a rise in temperature is about twice as great as that of steel. Where, therefore, the cable is so constrained that its expansion relation to the strand cannot be taken up by small undulations between the hangers, the expansion must occur like that of a metal bar or rod, manifesting itself at points such as the pole dips.

The Use of Long Cable Hangers Aids in Taking Care of Expansion and Contraction of Cable and Messenger.

That considerable expansion occurs has been clearly proven by cable sheaths showing bright abrasions where they moved through metal clips when the latter were rusted to the strand. In some cases the hangers have even been torn off. It has been found by actual observations that cables have moved back and forth at pole dips from three-eighths to three-quarters of an inch a day. In certain instances where the sheath happened to touch the strand the sheath has been scored by portions of the strand.

In some cases splices have been drawn out, as has been indicated by their collapsed conditions; in others splices have buckled on account of the ends of the cable being



Turning a Corner with Twisted Pair, An Unsightly and Expensive Practice.

pushed together. Pole dips are weak points in cable construction, and should be avoided. The expansion and contraction can best be taken care of, as already stated, by long hangers which will allow a springing in the cable instead of a concentrated effect at the pole dip.

To guard against electrical injury from outside sources, both cable and messenger are bonded and grounded at intervals. It has been found good practice to bond the cable and messenger together every 1,000 ft. and to ground every fifth bond. Where the length of cable does not exceed one mile, and is greater than one-half mile, a bond is placed at the office and the terminal point of the cable. In cables less than one-half mile long the office ground is considered ample. Cables should also be guarded from contact with trolley and light wires, as well as from chafing against trees or other obstructions, and this type of protector may best be determined by the conditions which exist.

In the termination of the cable in the central office two methods are employed, one where the cable itself or piece of wool insulated cable of the same size is fanned on the main frame and the other where the main cable is pot-headed and smaller lead covered, wool insulated cables brought from the pot-head to the main frame. The latter method is the more generally employed, except in regions where the amount of moisture in the air is very small, when the first described method is found satisfactory, and also the more economical.

In placing terminals of small size they should be located above the cable and on the side of the pole nearest the main cable. The latter terminal must be located below the cable because of the pole space which they occupy and the necessity of furnishing platforms and balconies for the men who have occasion to use them in the course of their employment.

Cuyahoga Company Orders New Switchboard.

Four sections of common battery, multiple switchboard for the new Union exchange of the Cuyahoga Telephone Company of Cleveland have recently been ordered from a prominent manufacturer. The order includes distributing frame, intermediate frame and relay rack. This equipment will be installed in the new building which is to be erected.

The Licensee Minority Stockholder

Where Does He Get off? What is the Game? Why are His Dividends Withheld? Can the Descendants of 1620 be Trusted to Play Fair with Any One in Their Power

By J. C. Kelsey

I noticed in the "Silent Partner" of April that "the Puritans were opposed to bear baiting, not so much out of sorrow for the bear, but because the sport gave pleasure to the spectators."

"The Puritans came to this country, not because they wanted religious liberty, but because they lacked the power in England to make the rest of the people follow their example."

This fact was proved by their expulsion of the Quakers and other sects which had been misled to Massachusetts by the religious liberty "bunk."

The Puritan was such a joy-killer that he would not kiss his own wife on Sunday.

The Puritan would have burned innocent women and men at the stake if matches had been cheaper, and the squirming of some poor wretch, strangling at the end of a rope, delighted his soul.

The Puritan stripped Quaker men, and women mostly, I imagine, and drove them naked through the streets into the barren and snow-driven woods.

The Puritan taught the Indian all he ever knew about lying, stealing, savagery and injustice.

The Puritan usually killed three women during his life, because New England graveyards show that John still lies spitefully by Mary, Sarah and Abigail. The family cow got more attention than these wives.

The country would be better today if Japs had landed at Portland, Oregon, in 1620.

To show what ancestry amounts to, there is a story that a pair of criminals raised a family, of which the following four generations donated 250 members to the penitentiary and a few to the gallows.

This is an extreme case, but it goes to show that most muddy water does not become clear, but goes on to fouler and blacker depths.

The traditions of the capital behind the Octopus are entirely bound up in the landing from the Mayflower, and the terrible deviltry that followed.

I leave it to the Independent telephone operator, who is flirting with the Octopus now in the humble sheep's clothing, if he thinks he can trust such a cult.

Look about you and try to remember a single man who has been happily connected with the Octopus as a stockholder or as an employe.

To my knowledge, no man has ever run up against this cult—it is not a system—and come out as well as he went in.

Take the Missouri and Kansas Telephone Company; once a company that boasted of not a single debt. How and where could this company spend $14,000,000, which is supposed to be its floating debt?

From 1882 to 1902, for twenty years, this company earned 30 per cent and paid 6 per cent to its stockholders.

It has always earned around $35 to $36 per station year. There is absolutely no reason why stockholders should be discouraged with the present bunk about annual deficit.

It is one of the surest things you know, that a telephone company earning $36 a station year should pay dividends, unless it is most foully managed.

We know that an interurban electric railroad that earns $6,000 a mile per year, or more, is making money on the investment.

And we know that an electric power company, retailing power at 10 cents, is making money on the investment.

We know that 3 cents a mile is a good rate for steam passenger traffic and we know that a railroad can survive on 2 cents.

A telephone company which earns $36 per station year or over, is a moneymaker, and any management that fails to return a dividend upon the investment should be shot at sunrise.

If a telephone company earns but $25 per station year, we can place it in the second class, and are not surprised at an absence of dividends.

Yet, in Independent telephone circles, dividends are honestly earned upon this amount, and as low as $18, too.

A Missouri and Kansas stockholder would have a pretty good case in court if he should care to ask this company to show true cause why dividends have not been paid.

Mr. Moxey testified in the K. C. rate case, 1902, that any other concern keeping books as the Missouri and Kansas Telephone Co. would have representatives in prison.

There is little excuse for the stockholders' dilemma. But these people have too much respect for corporations. They don't know them well enough yet. O! some day they will!

The Central Union Telephone Co. earnings range close to $36 per station year and better. There is no excuse for dividends being missing here, either.

The fact that a half-baked broker in the Central Union building at Indianapolis is advertising his desire to buy stock goes to prove that they can and will some day pay a dividend when the poor minor stockholder is entirely discouraged and out of it.

This company, earning such gross amounts, is either guilty of crime, or sheer incompetence, not to pay a dividend.

The Iowa Telephone Company has earned well, but has paid little or nothing.

The Western Telephone and Telegraph Co. is a gigantic concern of the Octopus, operating companies which, in turn, operates 300,000 telephones in Texas, Arkansas, Minnesota, Dakota, Wisconsin, Cleveland City, etc.

You have heard the definition, "A farmer is a man who

tills the soil." The agriculturist is one who tills the farmer.

The Western is simply an iniquitous holding company and only tills some telephone companies.

Its liabilities are nearly $60,000,000, or $200 per station. A fair dividend of 6 per cent would only require a net earning of $12 per station.

The Bell reports show average cost of operating and maintaining to be $22.60 per telephone.

As this territory is easily handled, the costs should not exceed $21 per station.

With $3 renewal reserve fund, the total cost would be $24.

A gross earning of $36 per station less $24 would leave $12, or a 6 per cent dividend.

But the Western only pays nearly 5 per cent upon a 6 per cent cumulative preferred stock, sixteen whole million dollars' worth, and the hopes of the common stock are in the sear and yellow leaf.

Surely the Western Telephone can operate as cheaply as the great average Bell plant.

Funny that somebody does not lose a job.

But somehow the parent company is content. That should satisfy the holders of the $16,000,000 of common stock.

The Michigan Telephone Co. was a disastrous failure, too. But it never earned less than $36 a station year.

When P. G. Reynolds went to Michigan for the old Erie crowd, he felt sorry for the men who were working for $35 a month.

And girls in Michigan work in a telephone exchange for less money than in any other state, except Tennessee, too.

Still they failed. No one said a word. The King can do no wrong, you know.

But, mark my words: In a later day, not far off, either, judging from the signs of the times, when the Bell company finally takes stock in the Central Union, Western Telephone, Missouri and Kansas, and other licensee telephone wrecks, in exchange for their floating debts, there will be a dividend of at least 6 per cent every year.

Some one has said that if a railroad president were sitting on the pilot of his trains, if such were possible, there never would be a collision.

And just the moment the Bell trades their floating debt birthright in the licensee companies for the mess of common stock, there will be no wrecks among the licensees. All stock will be dividend payers, and unfortunate holders are advised to store their stock in a safety vault.

Every licensee plant is making enough money to pay its stockholders some dividends, if the controlling interests chose to do so.

Ultra conservative management of any public utility is just as criminal as a loosely run concern, as far as a minor stockholder is concerned.

The very heart of the Bell earnings lies in their licensee interests. Each year you note increased earnings, and yet each year you hear of a weakening licensee plant.

The situation is quite inconsistent, and it looks as if some one was getting burned.

The Bell controls these companies and its own men operate them. They are specially trained men, trained in New York and Boston, and were sent West labeled "Missionaries." I wonder if they studied medicine, too.

The plants are all making money and the parent company is getting the first grab at the gate receipts. But it adds to the grandeur of the great public benefactor, and as well adds a few names to the long list of stock victims.

The Western Electric Company is owned 80 per cent by the Bell. The controlling directors on the board are said to own 189 shares out of 150,000.

For years this company flourished, and its policy was to interest employes in the stock.

They would go out of their way to interest some foreman in the stock.

And the company earned from 10 to 13 per cent of its gross sales.

Its stock was the delight of Marshall Field, and if he had lived I doubt if the present policy would have been tolerated.

At the end of 1906, the earnings proved to be $6,675,000 and it paid dividends of $1,200,000—leaving $5,475,000 for surplus.

You remember something about Egypt and Israelites. You know how Joseph guessed right on the crops, and being a crafty Jew, cornered the market. He became a leading citizen.

Scripture tells us that later "there arose a new Pharaoh in the land who knew not Joseph."

And it came to pass that a new man ruled in Boston, who knew not the Western Electric Co.

The discrepancy in 1906 of net earnings of $6,675,000 and dividends of $1,200,000, reminds us strongly of the Missouri and Kansas Telephone Co. which earned 30 per cent and paid but 6 per cent.

The rest of the money went somewhere—to missionaries, construction, copper-lined coal vaults, and gold rooms for office boys, possibly.

After the new Pharaoh came, the Western Electric Company sold over $50,000,000 worth of goods in 1907, and the profits were but $150,000.

Think of it, Mr. Telephone Man! You can grow gray in a single night, or in a year's time, and you can find a reason. But this company, without a single change of a hair, fell in one year from $6,675,000 to $150,000.

The new Pharaoh got busy, and 1908 saw a return to the Sphinx policy.

Just before the end of the year 1907, on December 4, the stockholders of the Western Electric Company got the following letter from E. M. Barton who had, to all appearances, no acquaintance with the new Pharaoh:

"Chicago, December 4th, 1907.

"To the Stockholders of the

"Western Electric Company:

"I enclose copy of an agreement which has been made between the American Telephone and Telegraph Company and the Merchants Loan and Trust Company. Any stockholder of the Western Electric Company desirous of making the exchange of his stock in accordance with this agreement may send to the Merchants' Loan and Trust Company his stock certificates endorsed in blank for transfer.

The Merchants' Loan and Trust Company will issue a receipt for the stock in negotiable form which will entitle the holder to receive on October 15, 1908, Two Hundred Fifty Dollars in convertible four per cent bonds of the American Telephone and Telegraph Company for each share of stock, or, at the option of the Telephone Company, cash at the rate of $225 per share. Interest at the rate of 4 per cent per annum will be paid on $250 for each share up to September 1, 1908. The bonds will bear coupons representing interest from said date.

"*It is to be assumed that payment will be made in bonds.* These bonds become due in 1936 and are convertible *at the option of the holder* at their face value at any time between March 1, 1909, and March 1, 1918, into stock of the American Telephone and Telegraph Company at the rate of about 134¼ per cent on the par value thereof, but this rate if subject to reduction, however, in accordance with the terms of the indenture securing the bonds if further stock shall be issued by the Telephone Company at less than $134.25 per share. That is to say, at the present rate of conversion, the holder of the bonds gives a trifle over $400 in bonds for $300 in stock.

"The present dividend rate of 8 per cent paid by the American Telephone and Telegraph Company on its stock is justified by its earnings.

"Stockholders of the Western Electric Company taking these bonds on the terms specified would then have an assured income at the rate of $10 for each share of stock, and they will have for a period of nine years the option of exchanging their bonds for stock, which, at the present dividend rate, would net from each share of Western Electric Company stock going into the exchange 14.9 per cent as against the present rate of 8 per cent.

"I enclose for your information a recent statement of the condition of the American Telephone and Telegraph Company.

"Stockholders of the Western Electric Company owning something over 15,000 shares have expressed the intention of accepting the offer. I shall do so.

"Stockholders accepting the exchange before December 15th, 1907, (the middle of the current dividend period of the Western Electric Company), will receive interest from November 1, 1907, as though the stock had been deposited on that date.

(Signed) "E. M. BARTON."

Coming at this time, it created surprise. The stockholders thinking of the 1906 earnings of $6,675,000, or $5,475,000 above the dividend requirements, could not see any reason for trading. Besides, it was generally tipped off by the previous Pharaoh, that a melon was to be cut.

February 1 came the report of 1907 earnings, with a doubtful showing of $150,000 for $52,000,000 sales.

Further, the directors solemnly authorized $15,000,000 of bonds, "not to be issued, but kept as they might become handy." A great deal like Ikey's fire extinguishers, which had gasoline in them.

This news was very reassuring (?) to employes who had for years been asked to buy the stock and take an interest in a fatherly company.

Anyway, it was tipped off all around among the Western Electric employes to let loose and they unanimously gave up their lifework to the greedy Puritan.

In 1909 "a new policy was adopted" with the Western Electric Company and it showed a profit of 4 per cent on its gross sales.

Compare this with the General Electric Company. It has a comparatively feeble monopoly, yet it pays dividends upon $60,000,000 of stock and interest upon $15,000,000 bonds.

But apparently there is no shame anywhere. They stripped their employes of the fruits of years of actual and bitter saving, and their action reminds you of "the wolf, having a bone in his throat, asked the crane to pull it out. The crane stuck his head into the red and murderous throat of the wolf and out came the bone. Being importuned for his pay, the wolf reminded him that he ought to be glad and feel well paid that he got his head out of the jaws of a wolf."

Anyway the Bell company is making 30,000 minor shares of the Western Electric Company stock look like 30 cents, and it is doing it in broad daylight.

Apparently everything is legal and honest. You know business men, guided by crooked lawyers, taught politicians all their dirty tricks, just as the Puritans taught the Indian what a rotten creature the white human being was.

It is all a great financial mystery. All Bell companies are earning first-class average incomes, which are well above the average cost of $22.60.

Their depreciation charges are vague and they have plenty left for dividends.

Why don't they pay them?

It is all a great political mystery. The latest news is that Charley Taft pays $28,000 a year for a private telephone line from Cincinnati to Washington from 6 P. M. to 6 A. M.

Is William Taft taking daily orders from his Bell Magnate brother? Is that the reason why the Government has whitewashed the Telephone Trust?

Is W. Murray Crane a Senator from Massachusetts, or an ambassador plenipotentiary from the Milk Street Monarchy to our weak-kneed Republic?

The Bell minor stockholder has a poor chance when the President has a Bell brother on the job, and a Wickersham to decide upon the merits of his case.

The Puritan in his day had no mercy. He is in hell today for his crimes—and his reflections upon his physical atrocities must be comforting.

The Puritan in control of the Octopus has naturally been born without the bowels of mercy, and some day he may have a chance to reflect upon some financial atrocities.

They follow their own conscience, and that is why the minor stockholder is getting it squarely in the neck.

Moral: Remember the Milwaukee Election!

Keystone Net Earnings for March Increased 7 Per Cent Over 1909.

The steady progress of the Keystone Telephone Company of Philadelphia is again indicated by the excellent showing in March earnings, which advanced $4,704, with a corresponding increase of expenditures of only $1,479. Following is the comparative showing for March and nine months:

	For month ended Mch. 31, 1910.	Year Previous.	For 9 months ended Mch. 31, 1910.	Year Previous.
Gross earnings	$95,101	$90,497	$835,661	$797,638
Operating expenses and taxes	47,490	46,011	420,828	395,985
Net earnings	$47,611	$44,486	$414,833	$401,653

Matters of Practical Interest

Are Construction Men Slow?

There was a cable layout described, with a request for criticism, on page 352, issue of March 19. This is still open for discussion, and the author would like to hear from those who can offer a suggestion, through TELEPHONY.

Calling Line to Cable Terminals Succeeds In Another Exchange—An Idea Added.

I have taken advantage of Mr. Frier's suggestion in the last issue and find it a great convenience. Each of my troublemen has a district of the city, and each one has picked up a pair in each cable box in his district. Each man has a jack on the desk and we find it does away with all the trouble of the operator's taking down the connection before they are through testing.

Marshalltown, Ia. A. J. Clarke, wire chief, Marshalltown Telephone Company.

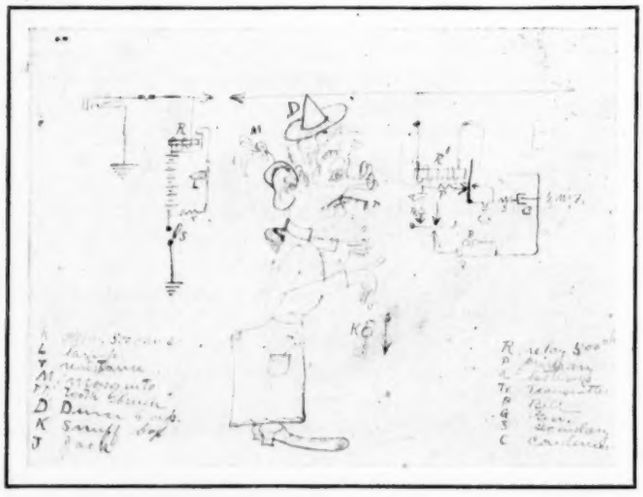
Guying Old Trees to Prevent Line Damage.

Many trees, liable to fall in a high wind, are a constant menace to lines, but cannot be removed. While tree owners will deny that there is a possible danger of the line being torn down, they can be led to admit they will allow any reasonable protection against such an accident, except the removal of the tree. In such a case a guy, securely placed well toward the top of a tree, will assist materially in preventing it from falling, acting as a brace against the wind. In case a side wind carries the tree over the guy will cause it to swing away from, or fall parallel to, the line, and not across it.

In guying for this purpose two clamps should always be used at each end of the guy. In nearly all cases the material can be recovered by the lineman after the tree has fallen, as the strand or clamps are of little use to a farmer.

An Eavesdropper Checkmated.

I am sending you the likeness, as near as I could draw from memory, of a typical "eavesdropper." Please notice the well developed ear, and the nose which has a wonderful capacity



The Eavesdropper Circuit.

to protrude into other people's business. Not even the mosquito seems to attract her attention, for she is in the act of taking down the receiver to "eavesdrop." Not being able to hear she thoughtlessly drops her snuff-box as she gazes intently at the telephone, which for the first time has "gone back on her."

In the diagram the receiver is normally short-circuited and the primary circuit open. When the operator closes special switch *S* battery flows through relays *R*, *R'* which closes the primary and takes the "short" off the receiver, thus making it possible to talk in the usual way. Try this on your own "eavesdropper!"

Tolar, Texas. Price Kiker.

Wasted Energy.

Two linemen were engaged in removing a dangerous tree from near a line. The tree had been felled and they were engaged in splitting up the trunk by means of iron wedges and a wooden maul, such as wood choppers use.

One of the men was a brawny fellow weighing close to two hundred pounds; the other a much smaller man tipping the scales at about one hundred and fifty. As men in their particular class there was little to choose between them. In this particular case the small man was making a joke of his larger companion.

"Aw, hit her again, Bill. Come on now, hit her hard," the little fellow was saying. "If you don't do better I'll have to take that maul."

The big man thus taunted struck the wedge with all his strength, but it did not seem to move more than a small fraction of an inch. Again he struck with like result. The little man laughed.

"Let me have her, Bill. I'll show you how to drive that wedge."

Bill relinquished possession of the maul with a sneering smile upon his face.

"All right," he said. "I give it up, and you will, too."

"Watch me," the little man replied.

Placing his feet carefully and resting the maul upon the head of the wedge to measure the distance, he raised the instrument above his head and brought it down with what seemed a display of little effort. Nevertheless the wedge settled into the tough log a good inch and there was a slight ending sound as the fibers gave way. With three blows he had driven the wedge to its head and opened a wide split half the length of the log. Bill was almost dumbfounded.

"Say, John," he said, "I'll admit I'm beat. Now tell me how you do it."

"I don't mind, for I want a little help on this job," replied John. "You see, Bill, it's partly a trick and partly something else. You use twice the strength I do in every blow you strike, but you don't use it right. You grab the maul handle, take a long breath, and raise the maul with all your strength: that is, you use as much strength in raising the maul as you do to bring it down. That's all wasted. It doesn't make a bit of difference how fast you raise it, it's got to stop before it can start down. Now, if you swing it in a circle it's about the same way. You use more than half your strength in swinging it to the top, and haven't anything to put in it when it will do the most good."

Cost and Returns of Advertising in a Moderate Sized Directory.

Receipts of $81 from advertising in its directory is an item on the right side of the books of the Elmcreek telephone exchange, Elmcreek, Nebraska. The directory has a bank advertisement on the front cover, and also carries a full page on the back cover, with 18 left hand pages inside, and a line at the head and foot of each right hand page; the balance of the latter being given up to the list of about 380 subscribers.

Mr. E. C. Krewson, proprietor and manager of the ex-

change, when invited to comment on the results of this use of directory space wrote to TELEPHONY.

"The advertising in the directory totaled $81. The expense was a dollar a page for the printing and binding, together with an expense of about $3 for linotype work for corrections on the list, with a nominal sum for postage, etc. There are thirty six pages in the book, and the total expense was less than $40.

"The expense of solicitation for the 'ads' was not counted, as it did not interfere with my other work. It was very little trouble to get the advertising; indeed some of it came in without solicitation. Our directory is evidently considered a very good medium for advertising among the people here. They all pay cash, or sometimes the equivalet in trade.

"The principal argument I used where any was necessary was the permanence of the advertising, and its comparative cheapness, the directory being in the hands of every telephone subscriber for six months. This is the second issue of my directory in this form, and this issue was easier to fill than the first one was, although larger.

"I buy the linotype metal used in the subscribers' list, and find that keeping it saves a great deal of trouble, and removes the main source of mistakes in reprinting the list, that of typographical errors. I simply have to correct the list as it stood for the last issue, then tie the pages up for the next issue."

To Preserve Calculagraph Ribbons.

Everyone having the care of calculagraph ribbons no doubt experiences considerable difficulty with them drying out in stock, so that when put in the machines they do not give clear impressions and in a very short time have to be removed. The balance in stock not being much better, very little relief is obtained from the changes. Perhaps some of this is due to the quality of the ribbons, and personally I believe that the "blue ribbon" is far superior to the purple, giving a clearer, better impression and having a longer life. In order to secure good impressions the ribbon must be moist, and any of them will dry out if left exposed to the air.

In seeking a method to overcome this evaporation, I found that the best results were obtained by keeping all ribbons in stock in an air-tight jar. A self-sealing glass fruit jar answers the purpose admirably, being both inexpensive and convenient.

By following the above plan a supply can be kept at headquarters and fresh ribbons furnished to exchanges as needed.

Note.—A sponge slightly moistened with glycerine placed in the jar will insure better ribbons.—*Southwestern Telephone News.*

The Lion and the Lamb.

The most important feature of competition which once existed between the Western Union Telegraph Company and the American Telephone & Telegraph Company was that of leased wire telegraph service. The news gathering agencies in all parts of the country offer a very substantial contribution to this branch of the industry.

At various times enterprising newspaper men have seen the wisdom of "putting their eggs in more than one basket." The telephone company has therefore secured very desirable leases from time to time only to have them cancelled frequently after brief periods. The cancellation was usually made upon a pretext of "poor service," and the manager or wire chief of the telephone company bore the brunt of the loss.

But the patience of these men in the ranks finally became exhausted and the inner facts were revealed. There was in reality not the slightest dissatisfaction with the service on the part of the subscriber; on the other hand he was partial to the telephone company's service and equipment, but it was found to be advisable to give the contract to the telegraph company because of conditions relating to special correspondents in a thousand cities scattered over the continent. These conditions could not be met by the telephone company.

But the lion and the lamb now sleep peacefully together.

An Attractive English Calendar.

The illstration reproduced herewith is from a calendar issued by Walter S. Vaughton, an electrical engineer of Birmingham, England, who is also engaged in telephone work. The reproduction unfortunately, does not do the subject justice owing to the calendar having been slightly damaged in the mails.

The Attractive Illustration on an English Calendar.

Not a few of the calendars issued by dealers and manufacturers of telephone apparatus and supplies in this country suffer by comparison with this one, which attracts instant and favorable attention to the subject, in this case the telephone being prominently brought to the mind.

A Competent Operator.

During the recent convention in the Hartman Hotel, Columbus, Ohio, many visiting telephone men were pleased to note the efficiency with which the branch exchange operator handled her duties. At times the rush of calls was very heavy, but the operator kept things moving rapidly and smoothly, and was not only courteous but actually added to her work by making inquiries over the telephone for guests who were too busy to do their own talking.

The way in which she rose to another energency is told in a local paper as follows:

"Manager Pellow, of the Hartman, decided to get real realistic, and string telephone wires and poles throughout the hotel lobby, incidentally perching a peacock on top of one of the wires. Then, to render the thing still more realistic, he tied a kite to the wires. The thing he produced for a kite was a monstrosity of the most antique character, so the telephone operator tried her hand at kite-making and produced a kite that would be a credit to any boy."

Depreciation*

By Major W. A. J. O'Meara, C. M. G.

Chief Engineer, the British Post Office.

There is some difficulty in considering the question of depreciation, owing to the fact that no two authorities on the subject appear to have included the same factors in the term "depreciation," and, further, there is no accepted standard method of telling from the accounting view the funds which should be set aside for the replacement of plant, etc.

Engineering Aspect.—The principal considerations affecting the question of replacement of machinery and plant, and the buildings in which they are housed, are as follows: (1) physical decay; (2) obsolescence, sometimes called antiquation; (3) inadequacy; (4) tenure of holding; (5) reconstruction requirements imposed by legislation; (6) unforeseen expenditure arising from accidents or other emergency.

Physical Decay.—There is a good deal of difficulty in providing a sure basis for the estimation of physical decay. This point is rendered clear by consideration of a few cases. For example, in the case of land it is desired that the exchange buildings should be placed as near as possible to a certain theoretical center. Unfortunately, owing to an unforeseen development, the location of this theoretical center may change, and thus the land may deteriorate in value. There may also be deterioration from other causes, such as the nature of the soil. In the case of buildings, the character of the building is, naturally, an important factor in fixing its prospective life, and here again the shifting of the economic center will affect the value of the buildings. Occasionally, however, there may be an appreciation instead of a depreciation.

The causes affecting the full life period of plant and machinery are more numerous than in the case of buildings. There is the inevitable "wear and tear," and, further, there may be negligence and incompetence. It may also be that destructive forces come into play and contribute to the destruction of certain classes of property. Take the cases of subterranean and aerial cables. The principal causes of deterioration which affect their "life" are: (1) Mechanical injury; (2) chemical decomposition; (3) electrolysis; (4) vibration; (5) lightning; (6) attack by insect—*e.g.*, by the cable bug, whose appearance in Australia, California and southern portions of the United States has been noted.

Similarly, poles are liable to (1) mechanical injury; (2) attack by fungus growths; (3) destruction by woodpeckers and insects.

In both these cases clearly the external forces are more potent than those arising from the "duty" imposed by the user of the plant—that is, the factors usually referred to as wear and tear.

The most correct estimates of the average "life" of the various classes of plant involved in any undertaking can best be secured by means of statistics. Depreciation is to some extent dependent upon the character of the day to day maintenance which has been provided, but it should not be forgotten that local conditions also play an important part. The chief requirement in order that an engineer may be properly assisted in this matter clearly consists in the preparation of a carefully compiled record, in which the various descriptions of machinery and plant are properly classified. Such a record should show the causes for which any machinery, plant, etc., have been put out of service, the period during which they were in use, and a statement of local conditions likely to have affected their life.

Obsolescence.—This factor is of great importance in telephone undertakings, owing to developments that take place from time to time, and to the fact that the public soon learns to clamor for any invention giving a more convenient service.

Inadequacy.—The item affecting depreciation which is the most difficult to cover by an estimate is that of inadequacy. It may be that the growth of subscribers has been inaccurately predicted, that the buildings cannot provide sufficient accommodation, or that overhead distribution has to be replaced by an an underground system, owing to insufficient carrying capacity having been provided in the original pole lines.

Tenure of Holding.—This may affect any class of telephone plant. Switchboards may be installed in a rented building or plant may be placed on private property under a way-leave agreement containing a removal clause. Removal may be necessary before the expiration of a natural, or even useful, life; but if such cases are carefully recorded it will not be difficult to make a fairly satisfactory allowance in estimating depreciation.

Reconstruction Requirements Imposed by Legislation.—It sometimes happens that great expense is incurred owing to the exercise of statutory powers conferred upon public authorities and corporations necessitating the reconstruction of works. In one case in which a very considerable mileage of wire was affected, the payments in respect of the reconstruction of telegraph lines involved amounted to 50 per cent. of the capital value of the plant disturbed, after making due allowance for value of recovered stores.

Unforeseen Expenditure Arising from Accidents or Other Emergency.—I now come to the last of the factors mentioned as requiring consideration in connection with the replacement of machinery and plant—namely, unforeseen expenditure arising from accident or other emergency. I am inclined to agree with those engineers who hold the view that any replacements on a considerable scale rendered necessary in such circumstances should really be provided for by means of an insurance fund or by payments of annual premiums to an insurance company.

Estimates of "Life" of Machinery and Plant.—The foregoing cursory investigation of some of the details of the factors which determine the useful "lives" of machinery and plant, etc., seems to indicate that if estimates relating to depreciation are to be tolerably reliable it is desirable that the machinery or plant shall be scheduled under a sufficient number of distinct classes. Such classification will enable the engineer to give proper consideration to the effect which each of the first five factors mentioned by me as influencing depreciation will probably have on the peculiarities of each type of machinery, plant, etc., for admittedly all the factors mentioned do not affect every type of machinery or plant in the same degree. As an illustration it is necessary to mention a single factor only—namely, obsolescence. Little experience is necessary to tell us that in the past the internal plant of a telephone system has been affected by this factor to a far greater extent than the external plant, and that this condition of affairs is likely to continue.

In an undertaking which has been in existence for a considerable number of years, and which comprises large quantities of plant of the various descriptions required for its conduct, carefully kept records relating to such plant will afford a secure starting point for the appraisal of the "lives" of various classes of machinery and apparatus employed in the undertaking under consideration, and they will give fairly accurate information concerning the average "lives" of cer-

*Abstract of a paper read before the Institution of Post Office Electrical Engineers, April 4, 1910; reprinted from the London Electrician.

tain classes of plant, the replacement of the greater proportion of which has arisen solely on account of physical decay. Such "lives" may be considered to be the maxima for these classes. In order to estimate the useful commercial "life" it becomes necessary to make deductions from the foregoing maxima in respect of those factors which particularly affect the depreciation of any class of plant. The approximation of the deductions to the true value will depend not only on the extent and quality of the experience of the engineer responsible for the estimate, but on the possession by him of early and accurate information of the nature of the progress inventors are making in the design of new plant, and of a correct appreciation of the real importance of the improvements foreshadowed. Some persons appear to have a highly developed intuitive faculty for prognosticating coming events, and in view of the problems which will fall to the lot of the engineer, it seems desirable that members of our profession should be well endowed with the quality for accuracy in prediction—that is, with a prophetic insight.

I have prepared a table (Table I.) showing the estimated years of life which have been assigned to certain classes of plant. It is hardly necessary for me to state that the inclusion of the table in this paper is in no way to be considered as an acceptance on my part of the accuracy of any of these estimates. The statement of "lives" is placed before you rather with the object of showing that engineers are not entirely in agreement regarding this important matter. It may reasonably be asked how the disagreement of experienced engineers on this question is accounted for. It is possible that an explanation of the divergence of views may be found in some or all of the following considerations:

1. Engineers do not yet work to standard specifications. For example, tin is not contained in the lead covering of all aerial cables; again, in some cases petroleum jelly is employed as a lubricant when lead-covered cables are being drawn into ducts, and in other cases no lubricant is used. These prove to be important factors in actual practice. The absence of tin or the addition of 3 per cent of this metal in the lead sheathing of an aerial cable really determines whether the "life" of the cable will be a comparatively short one or long one.

In the case of underground cables the use of petroleum jelly has actually proved to be a protective agent against chemical attack, and, in consequence, cables treated with this substance have a longer average "life" than those which are not so treated.

2. Since machinery and plant of similar types are not generally exactly similar in all respects, it follows that the character of the day to day maintenance in connection with their operation also varies. This appears to be particularly the case in connection with telephone enterprises.

3. In determining "lives" the same factors (*i. e.*, obsolescence, inadequacy, etc.) are not always included, nor are the same values attached to those factors which have been included in the calculations.

4. Not only do views vary on the policy to be adopted in discarding obsolescent plant, which is largely a question of the temperament of the responsible officials, but, as already stated, the extent of knowledge regarding improvements in progress and the experience and judgment of different engineers naturally vary considerably, and hence the personal equation of the responsible engineer has considerable influence on the completed estimate.

Depreciation which covers the total annual loss on the plant is sometimes divided by engineers (as shown in Table I.) under two heads, which may be termed "ordinary depreciation" and "extraordinary depreciation." The former term takes into account the life of the plant due to age and to advances of the art, and the latter expression covers wastage due to the necessity for reconstruction brought about by legislation.

Property.	*Engineer, Manufacturers' Telephone Company. Depreciation. Further Description of Property.	Life in years.	Per cent.† No Int.	Scrap value.	Per cent to ‡ Reconstruction.	*Engineers, Chicago Telephone Company. Depreciation. Further Description of Property.	Life in years.	Per cent.† No Int.	Scrap value.	Per cent to ‡ Reconstruction.	*Chicago Telephone Commission. Depreciation. Further Description of Property.	Life in years.	Per cent.† No Int.	Scrap value.	Per cent to ‡ Reconstruction.	Another American Authority. Depreciation. Further Description of Property.	Life in years.	Per cent.† No Int.	Scrap value.	Per cent to ‡ Reconstruction.
Conduits	All types	50	2	..		Main	33	3.3	0	1	Main	50	20	0	1½	Main	50	2.0	0	
	..	..	..	..		Subsidry	14	7.1	0	2	Subsidry	20	5.0	0	2	Subsidry	15	6.7	0	
Underg'nd cables	All types	20	5	..		Main	16½	3.5	42	2	Main	20	3.0	40	2	Main	20	3.0	40	
	...	..	..	..		Subsidry	12	4.8	42	2	Subsidry	15	4.0	40	2	Subsidry	13	4.6	40	
Aerial cables	All types	20	5	..		...	11	6.0	34	3	...	15	4.0	40	3	...	12	5.8	30	
Poles, including cross arms	...	20	5	..		...	8½	11.8	0	6	...	10	10.0	0	4½	...	10	10.0	0	
Aerial wire, copper	...	..	..	..		...	15	2.0	70	5	...	15	2.0	70	3	...	12	5.0	40	
" Iron	...	6⅔	15	..		...	..	..	..	..	...	..	..	..	..	...	8	12.5	0	
" drop wires	...	..	..	..	3¼	...	7½	11.7	12½	10	...	8	10.6	15	4	...	10	9.0	10	
Aerial terminals	...	..	..	..		...	12½	8.0	0	8	...	12	8.3	0	3	...	10	10.0	0	
Subscribers' instruments	...	10	10	..		...	10	10.0	0	5	...	10	9.5	5	2	...	10	10.0	0	
Private branch exchange boards	All types	12½	8	..		...	10	10.0	0	5	...	8	10.0	20	2	...	8	11.3	10	
Central office switchboards	All types	12½	8	..		...	7	14.0	2	6	...	8	10.0	20	2	...	8.4	9.9	17	
Buildings	...	20	5	..		...	33	3.3	0	1½	...	40	2.5	0	1	...	24	2.6	38	

Figures not available.

* Extracts from Report of Special Telephone Commission, Chicago, 1907. †Ordinary Depreciation. ‡Extraordinary Depreciation.

Table I.—Table Showing Depreciation of Plant Connected with a Local Telephone System as Assessed by Various American Authorities.

Accounting Aspect.—When the engineer has settled the basis on which the proper allowances for depreciation can be provided in the most effective manner, the first question which has to be considered is the method by which the determined amount for depreciation shall be made available when renewals become necessary. This is almost entirely an accounting matter.

It may be well to explain that accountants usually apply the term "depreciation" to represent "the amount which has to be

charged against the profit and loss account in respect of any class of wasting or perishable assets before the real profit from an accountancy point of view is arrived at. The items which have hitherto been referred to as buildings, machinery and plant are known amongst professional accountants as "wasting assets."

But the expression "wasting or perishable assets" covers much more than physical property; the expression includes also intangible property—for example, "goodwill." Intangible properties, like physical properties, are subject to depreciation, as the exhaustion of the field of development of the termination of an enterprise may extinguish their values as assets in a commercial undertaking.

In the case of a long-established railway corporation owning hundreds of miles of track and large quantities of rolling stock, depreciation is cared for year by year by the replacement annually of a suitable number of locomotives, wagons, etc., and also by the renewal annually of portions of the permanent way, storehouses, station buildings, etc.

In the past the Post Office has, in respect of the renewal of the telegraph and telephone systems, practically followed a plan very similar to that adopted by railway companies; the sums

Original cost of machine, £1,000. Estimated life, 5 years. Anticipated expenditure on repairs and renewals, £120.

Year.	1st Method. Annual Depreciation. £	1st Method. Act. Rep. and Ren. £	1st Method. Total. £	2nd Method. Annual Depreciation. £ s.d.	2nd Method. Act. Rep. and Ren. £	2nd Method. Total. £ s.	3d Method. Annual Depreciation. £	3d Method. Act. Rep. and Ren. £	3d Method. Total. £	4th Method. Annual Depreciation. £ s. d.	4th Method. Act. Rep. and Ren. £	4th Method. Total. £ s.	5th Method. Annual Depreciation. £ s.	5th Method. Interest 3% Compound. £ s. d.	5th Method. Act. Rep. and Ren. £	5th Method. Total. £ s. d.	6th Method. Annual Depreciation. £	6th Method. Act. Rep. and Ren. £	6th Method. Total. £
1st ..	200	..	200	500 0 0	..	500 0	224	..	224	181 0 0	..	181 0	188 7	...	..	188 7 0	400	..	400
2nd ..	200	10	210	250 0 0	10	260 0	214	10	224	190 1 0	10	200 1	188 7	5 13 0	10	204 0 0	190	10	200
3rd ..	200	20	220	125 0 0	20	145 0	204	20	224	199 11 0	20	219 11	188 7	11 9 6	20	219 16 6	100	20	120
4th ..	200	60	260	62 10 0	60	122 10	164	60	224	209 11 0	60	269 11	188 7	17 9 6	60	265 16 6	120	60	180
5th ..	200	40	240	62 10*0	40	102 10	194†	40	234	219 17 0	40	259 17	188 7	23 13 0	40	252 0 0	190	40	230
Total..			1,130			1,130 0			1,130			1,130 0				1,130 0 0			1,130

* Balance of total written off. † Difference between estimated and actual result corrected in last year.

NOTE.—The first method represents equal annual contributions towards depreciation.
In the second method depreciation is represented at 50 per cent per annum on actual value of asset.
In the third method the total amount in respect of depreciation and repairs in each year is equal.
In the fourth method the net charge to revenue each year is the difference between depreciation and interest plus provision for repairs.
The fifth method contemplates the building up of a reserve fund.
The sixth method is arbitrary. In this case revenue is charged with the difference between the book value of the asset and its actual value at the present time, as estimated by an expert valuer.

Table II.—Six Methods of Dealing with Depreciation Based on Tables Contained in "The Commercial Management of Engineering Works," by F. G. Burton. The Scientific Publishing Company of Manchester.

expended for this purpose, however, were formerly merged with the account for day to day maintenance, but in recent times a special subhead has been introduced to which renewal expenditure is charged.

Further, in connection with the Post Office telephone business, the Postmaster-General renders a financial statement in order to indicate the commercial results obtained. On examination of this statement it will be observed that amounts expended in respect of depreciation are separately recorded.

In addition to the methods for dealing with depreciation mentioned above, others are also to be found. In fact, Prof. Dicksee has mentioned that he himself has found six methods in vogue for writing off depreciation, namely:

1. Charging each year with the actual cost of repairs and small renewals and an equal fraction of the original cost of the asset.

2. Charging each year with repairs and small renewals and with a percentage for depreciation calculated at such a rate as to reduce it to its realizable value by the time it becomes useless for revenue earning purposes.

3. By estimating in advance the total sum chargeable against revenue for repairs, partial renewals and original cost, and charging each year an equal portion of it.

4. By charging revenue with such sum as will at the expiration of the life of the asset write off the original cost thereof, plus interest on the capital from time to time invested therein.

5. By charging revenue each year with actual or average expenditure upon repairs and small renewals and with such further sum set aside and invested at compound interest as will accumulate to the original cost of the asset at the expiration of its estimated life.

6. Charging revenue with the difference between the book value of the asset and its actual value at the present time, as estimated by an expert valuer.

The results which would be obtained by tabulating the anticipated expenditure in repairs and renewals under each of the above methods in respect of a machine of which the original cost and the estimated life are assumed to be £1,000 and five years respectively are given in table II.

It will be observed that no allowance has been made for the "scrap" value of the machine in these calculations, and that current repairs have been charged to the depreciation account, and in these respects the methods given do not agree with the practice adopted by the authorities quoted earlier in the address—in fact, maintenance appears to have been confused with depreciation.

The conditions affecting various classes of undertaking differ so widely that it certainly cannot be asserted that any one of the methods for dealing with depreciation is the best. The really important matter is not the scientific correctness of the records in the company's account books, but the necessity of having cash available at the moment it is required to pay for replacements which may have become necessary. This requirement points to the necessity of forming a "depreciation reserve," and renders it undesirable to employ funds set aside for this purpose in the undertaking itself; rather is it desirable that such funds should be invested in easily realizable securities.

It will doubtless occur to you that in those cases in which services have to be provided under contracts for stated periods there is some advantage in making provision for depreciation on a basis which involves equal annual payments, as the rates to be charged which are naturally a function of the annual expenditure incurred in providing the service can thus be readily calculated. Methods 1 and 5 given in table II. are both equally satisfactory from this point of view, and in consequence are eminently suitable for adoption in connection with telephone undertakings and similar enterprises.

It has been asserted that greater accuracy in determining the value of "wasting assets" would be obtained by periodic valuations and writing off such loss as these valuations show than by a mere process of book-keeping. The principle of such periodical valuations has been accepted in America and also to

some extent in this country, and there certainly appear to be some advantages in adopting this method of treatment. One of these advantages, but not the least, is that a useful check is established for comparing the actual with the estimated depreciation in any case.

Conclusion.—I now come to my final remarks.

It is generally accepted that often it is on the rate provided for depreciation alone that the fortunes of an undertaking may turn in deciding whether a profit or loss is being made at every period of its existence. The duty of the engineer is concerned not only with the design of works alone, but also with their operation and commercial value, and, therefore, his advice will often decide the fortunes of an engineering enterprise.

In every important phase in the development and progress of such enterprises the engineer is faced with the problem of depreciation; he is further much concerned with the exact method of providing for depreciation. If a wrong choice is made, money is absolutely wasted.

The problem confronts him from the earliest days of the inception of an engineering project and matures when competitive tenders for the work first come under consideration. We know that it is not the capital cost alone which determines whether one scheme is more advantageous than another; a comparison of total annual costs in respect of the tenders received is necessary to enable an engineer to decide which scheme is the more profitable one to adopt, but annual costs are made up of interest on capital, of depreciation and of operative or running costs. As regards any particular tender, the interest on capital and the operative costs are together a constant quantity. The method of allowing for depreciation may, however, vary, and it will, therefore, be seen that, according as method 1, method 5 or some other method shown in table II. is adopted to complete the figures for the comparison of tenders in respect of two alternative schemes, the annual balance may turn in favor of one tender or another. The engineer is not always in a position to dismiss the question of depreciation from his thoughts when it has been finally decided that some particular tender for plant or machinery required for his purpose is the most advantageous one, and when in consequence that tender has been accepted. It has already been stated that allowance will have been made in engineers' calculations for obsolescence. In many cases his anticipations in respect of this factor will be realized, for the inventor is sure to come to his assistance with improvements and claims. In practice, however, it will often be difficult to decide exactly at what date it will be justifiable to replace plant doing effective service by some new invention which may have been "proved in" as eminently satisfactory on being "tested out." In such cases the engineer has to compare a situation in which he has fairly complete knowledge of the value of the various technical and financial factors requiring consideration with one in which he cannot with the same certainty attach reliable values to the important elements coming into play in connection with the invention, and, further, the value of apparently efficient plant or machinery to be scrapped is sure to attract considerable attention; in such cases the charge against the depreciation account will indeed loom large. A bold and courageous policy has often proved advantageous in the past in connection with the handling of obsolescent plant, and it is certain to do so again in the future.

In considering the very important question of turning out good plant in favor of new designs of machinery alleged to be more economical, the problem resolves itself into a consideration of the question whether the difference in annual costs likely to be incurred in respect of the new machinery and the actual annual costs incurred in respect of the existing plant is sufficiently great to pay for the "wastage" or value of the unexpired useful life of such parts and the cost of removing such of it as may be "scrapped.' For instance, in an example given in a table the loss shown under plant deductions will have to be extinguished within a reasonable time after its replacement. In such cases, also, clearly depreciation and the method by which it is provided may be the ruling factors in the commercial situation.

There is still another aspect of the case which, although of not such frequent occurrence, is of immense importance, and that is the aspect in connection with the valuation of the property of a "going" concern for the purposes of a purchase. The question of the allowance to be made for depreciation becomes in these cases perhaps more controversial than in any other situation. The engineer advising the purchasing party has a double duty to perform. He has to protect his own client, and at the same time he has always before him the responsibility of being just to the selling party.

The engineering problems relating to a proposal to purchase a "going" concern for all practical purposes involve considerations similar to those connected with alternative tenders, for it is simply a case of considering annual costs in respect of the "going" concern as compared with such costs in respect of the new plant which would do the same work as well if not better.

The subject of depreciation is of vital importance to shareholders of public undertakings, and it is certainly of no less importance to the public generally, who are to some extent involuntary shareholders in the undertaking which absorbs our energies.

Since writing this paper my attention has been drawn to an interesting pamphlet entitled "Introductory Notes on Leake's Register of Industrial Plant." Mr. Leake is a great authority on depreciation and I can thoroughly recommend to you, not only a study of this Introductory Notes, but also the perusal of the papers on depreciation which he read before the Institute of Directors in March, 1907.

Elson Bill Lobby Investigation.

In the resumption of the investigation of the probe committee of the Ohio house of Representatives on the alleged questionable methods used to secure the passage of the Elson bill through that house. Representatives Detmars of Holmes county testified that Judge Winters told him that he had been offered any thing he wanted to vote for the bill. Representative Pocock of Paulding county named Attorney Alfred Wilcox of Paulding, President Durfee of the Paulding Independent Telephone Company and President Geiger of the Byran Independent Telephone Company as lobbyists. Representative Kirkpatrick of Adams county again named John Murphy of the Cincinnati and Suburban Telephone Company as trying to influence his vote on the bill. Representative Bowersox of Williams county testified that Circuit Judge Donnely of Napoleon had lobbied for the bill and that Attorney Dunbar of Cincinnati also asked him to vote for it.

The committee examined a number of representatives who testified that they knew of nothing improper or criminal in the passage of the bill.

It was recommended that the telephones in the capitol be operated by employes of the house, rather than by paid agents of the telephone company, who would be in a good position to lobby for or against telephone bills. This recommendation was based on the testimony of Representative Pears, who said that Simon Cronin, the Bell employe in the house, lobbied for the passage of the Elson bill.

Representative Pears failed to name a dozen men who know considerable about the alleged improper methods, as he said he would. He said that he intended to say that lobbying by Cronin was generally known, and that he believed that the testimony of many of the members would bear him out in that statement.

A letter was introduced from Attorney Cyrus Huling of Columbus denying that he was the author of the Elson bill.

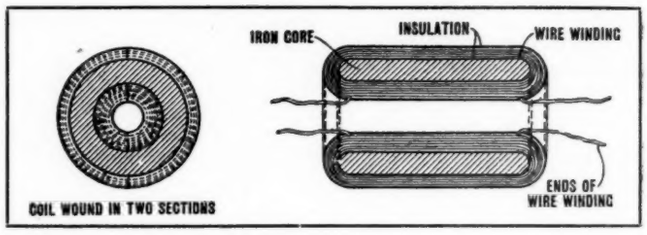
The British Channel Loaded Cable

At a recent meeting of the Physical Society of London a paper on "Telephone Circuits" was presented by Prof. J. Perry. It dealt with the mathematical calculations of the attenuation on telephone lines.

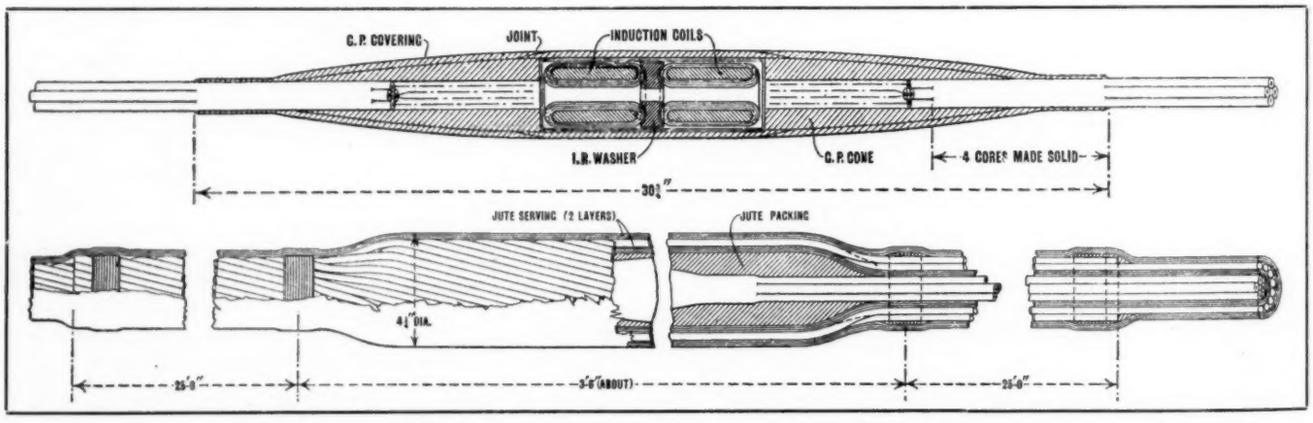
In the discussion which followed, Major O'Meara, Engineer in Chief of the Post Office, gave out some interesting data regarding a new telephone cable which is to be laid between England and France, to supplement those now employed between London and Paris. A description of this cable, including the data given by Major O'Meara, was published in *Electrical Engineering*, and an abstract of this article follows:

As a result of negotiations between the two countries, it was decided that two new cables should be laid, each containing four wires (two circuits). One cable will be laid by each government; but while the French cable will probably be more or less of the same type as those already in use, the British one, which is already manufactured and is waiting at Woolwich for a favorable opportunity for laying it, embodies the most recent improvement in the design of long distance telephone lines, viz., the insertion of "loading" coils at intervals along its length. Instead of its scope being limited to conversations between London and Paris, it has been designed so that it will be possible to converse through it between Paris and all the large towns in the Midlands and North of England, and even to Glasgow, by utilizing the existing land lines. Tests show that the electrical properties of the cable predetermined by the designers have been accurately fulfilled, and it is reasonable to expect that, when once the cable is taken into use between Paris and London, the extension of the telephone service to the North will be carried out as soon as the necessary traffic arrangements have been completed by the authorities. The cable will be laid by the makers, Messrs. Siemens Bros. & Co., from Abbotts Cliff, halfway between Dover and Folkestone, to Cape Gris Nez.

This cable will be the first submarine salt water cable in which "loading" or inductance coils are distributed throughout its length on the Heaviside-Pupin principle. It is the outcome of the experimental work of Mr. W. Dieselhorst, who laid the lead-covered cable with loading coils in the Lake of Constance in 1906. He then realized the difficulty that would be experienced in dealing with lead covered cable in submarine work, owing to its great weight and the damage which would be caused to a lead cable in tidal waters. Experiments were started on the insertion of loading coils in gutta-percha covered cables, and a method of doing this, which is that in use in a slightly modified form in the new Anglo-French cable, was patented by him, in conjunction with his firm in November, 1906. An experimental cable made in this way was left in water for fifteen months, and occasionally subjected to a pressure of four tons per square inch, corresponding to a depth of 2,500 fathoms of water. This cable was found to withstand these tests without injury, and was brought to the attention of the Post Office engineering staff. Finally, when tenders were invited for a loaded cable for laying across the English Channel, Messrs. Siemens Bros. & Co. were able to guarantee a standard cable equivalent length of 3.5 miles for the total length of 21 nauts (24.2 miles), and their tender was accepted. The tests of the cable after manufacture have shown that the actual cable has a standard cable equivalent of 3.28 miles, which is still better than the guaranteed figure. Without loading coils, a mile of the same cable has a standard equivalent cable length of 0.435 mile, and therefore the actual gain due to the addition of loading coils is equivalent, in its effect on the speech transmitted, to reducing the length of the cable 3.2 times. The cable is a four-core cable with conductors weighing 160 lbs. to the mile, insulated with 300 lbs. (per mile) gutta-percha, the resistance of the conductors per loop mile is 12.5 ohms, and the wire to wire capacity 0.12 m. f. per mile. The inductance coils, each of slightly less than 6 ohms resistance, with an inductance of 0.1 henry at 750 cycles per second, are placed at one naut (1.153 miles) apart. The actual attenuation constant of the cable is 0.0140 per mile, while the cable without its inductance coils has an attenuation constant of 0.045 per mile. As the cable and coils were designed for an attenuation constant of 0.0147 after preliminary experiments had been made, the closeness to this figure is extremely satisfactory.



Sectional Views, Showing Design of the Coils.



Arrangement of the Coils in the Cable and Method of Sheathing Over the Coils.

In the insertion of loading coils in a submarine cable, the mechanical problem is even more important than the electrical one. The coils have been inserted so compactly that the part of the cable containing them can be paid over a 4 ft. sheave without damage. The illustrations show the design of the

coils, and the method of inserting in the cable. They increase the diameter of the gutta-percha core from about 1 in. to 3 ins. A gutta-percha cone is inserted at each end as packing, and gutta-percha sheet is wrapped round them and jointed to the gutta-percha of the core at each end.

In the first designs of the cable four loading coils inserted one after the other, one for each of the four wires of the cable were used, but now two double coils are employed. Each double coil consists of two windings on the same iron core, and one winding is connected in series with each conductor. This has an advantage over four distinct coils, as the iron core experiences an aging effect which affects its permeability, and may not be precisely the same in two cores. If separate coils on separate iron cores were used for the go and return circuit, the gradual change in permeability might disturb the even balance of the circuit, but by winding them on the same core the variations are automatically compensated. Between the silk covered wire of the coils and the gutta-percha sheet there is a sheet of metal foil, not shown in the illustration. This was found to be a necessary precaution in the construction of the cable, and has been patented. An annular rubber distance piece is inserted between the two sets of coils to give greater flexibility.

The method of armoring is extremely ingenious. At about 10 yards before the position of the coils is reached, the stranding machine is stopped, and a second armoring is started on the top of the other one. When the bulge in the cable is reached the wires of the second armoring, which, of course, is given the same lay as the first, automatically place themselves between the other wires, so that the part of the cable with the increased diameter is covered with a single layer of the armoring wires. At about 10 yards on the other side of the coils, the additional wires are cut and bound up as before.

Major O'Meara adopted this type of cable in the face of much criticism by Continental experts. It has been stated freely that the high specific inductive capacity of gutta-percha would render a cable insulated with this material unsuitable for loading with coils, and that the calculations employed in the design would therefore be falsified. The tests already alluded to have shown, however, that this is far from being the case, and some tests made by the Post Office engineers last October and November on some of the Danish government "continuously loaded" cables show that the coil method of loading is far more effective. The "continuous loading" consists of covering the copper conductor with a close spiral winding of thin iron wire throughout its length. Obviously this cannot increase the inductance to the same extent as the insertion of coils at intervals, and at the same time it materially increases the capacity of the cable. Actual measurements against standard cable compared with the values calculated for the same cables as those under test, but without the continuous iron winding, showed that the improvement due to the "continuous loading" was about 60 per cent, whereas with coil loading an improvement of from 250 to 370 per cent has been shown to be practicable in the Post Office cables in England—the former by experiments with gutta-percha cables, and the latter with paper-insulated cables.

Plans for Extending Morgan Plants in Ohio.

Estimates are now being received at the office of the Columbus Citizens Telephone Company, from engineers and managers of all the telephone companies in Ohio controlled by J. P. Morgan & Co., dealing with the amount of new work which will be required this summer. It is proposed to install all new equipment necessary to bring all the plants into first class condition. As soon as the plans and estimates have been gone over by the engineers and approved by F. A. Davis, president of the United States Telephone Company and its subsidiaries, the money to finance the betterments will be forthcoming.

Report on Louisville Rates.

Henry Burnett, who is Special Master appointed by the Federal Court in the case of the Cumberland Telephone and Telegraph Company against the city of Louisville to prevent it from enforcing its telephone rate ordinance, will submit his report to Federal Judge Walter Evans May 1. The report is said to cover more than 100 typewritten pages, and will contain a great deal of matter relative to the rates, finances, etc., of the Cumberland. The decision of Judge Evans will be based largely on the report.

Cumberland Working the Old "Press Agent Game."

That the Cumberland telephone company is able to work off on local papers deceptive articles written in its own interest as original matter, frequently as bona fide items of news interest, is evident from the extended series of clippings duplicating a certain article which has been received at TELEPHONY's office. The reproduction here presented is from the Hopkinsville, Ky., New Era of March 19, 1910. This is about the only paper of the lot which is decent enough and has enough self-respect to designate the article by the letters "advt.," which shows that it was inserted, and presumably paid for, by the Cumberland company. There is no question but what a lot of the little newspapers throughout the Cumberland territory have been "easy" enough to print the Cumberland's advertisement without getting paid for it, in the belief that it was a genuine news item—instead of a joke.

Telephone Values—Single System vs. Dual System

KNOXVILLE'S "OLD" TELEPHONES

Our friends at Knoxville are in a bad way over their telephone service. That city, it should be understood, it maintaining two telephone companies and they are getting as a consequence poor service according to a report made of the action of the board of trade recently taken. It appears that Knoxville has to ring the old-fashioned crank still, although we believe they do not have to call for "one on two" as they had formerly to do. Still the people of the village appear to have waked up and found that with the old "crank ring" they are about ten years behind. The occasion for this antedated system is that neither of the companies feels that it can afford to spend any very large sums of money for additions and up-to-date improvements and take the chances of securing business enough to justify it, for each seems to feel that whatever improvement one installs will be added by the other and the same old nuisance and ruinous competition will continue without any appreciable financial benefit to either

Chattanooga forestalled all that sort of trouble some years ago by the sensible contract it made with the East Tennessee Telephone company. As a result we have had the automatic central energy system for years and at the same price the Knoxville subscriber pays to either of the two companies there and we get an infinitely better service. The Knoxville patrons who use both companies pay twice as much as the Chattanoogan who uses only one.

Besides improving the service the policy adopted here has proved of immense benefit not only to the company but to the people themselves. It has enabled the company to double its list of subscribers and the people to get in direct communication with each in a reasonably cheap and convenient manner. It might be stated, incidentally, that the telephone exchange in this city has 6,000 subscribers, which is 50 per cent., or nearly so, more than both companies together have in Knoxville. Of course a large part of this superior number is due to the fact that Chattanooga is a larger town that Knoxville, but that hardly explains why Chattanooga has double the telephone subscribers [illegible] East Tennessee company's service in Knoxville has, and nearly three times the number of the independent company, for we are not yet quite double the [illegible] of our neighbor, although we hope to be.

The problem is a serious one for our neighbor to solve, and we shall watch with interest how it is to [illegible]one.—Editorial Chattanooga Times, March 16.

Advt.

This Matter, Probably Prepared by the Cumberland Telephone Company, or in Consultation with its Officers, is Reproduced as an Advertisement in Hopkinsville, Ky., New Era. Through Cumberland Influences It was Reprinted in Many Other Southern Newspapers and in Almost Every Case Without the Designation "Advt." This is an Old Bell Trick for Improperly Influencing Public Opinion.

From the Legal Viewpoint

By A. H. McMillan

Charter Fee on Foreign Corporation Burdens Interstate Business.

The United States supreme court has reversed the decree of the supreme court of Kansas, restraining the Western Union Telegraph Co. from transacting local business in the state. The action was brought by the state to oust the company from doing, in Kansas, any telegraphic business that was wholly internal to that state and not pursuant to some arrangement, or to meet its contracts with or obligations to the government of the United States. Under what was known as the Bush Act, a state charter board was organized and authorized to receive applications from foreign corporations seeking permission to engage in business in the state. It was required to make a formal application accompanied by an application fee of $25. It was also required to pay to the state treasurer, for the benefit of the permanent school fund, a charter fee of 1/10 of 1 per cent of its authorized capital upon the first 100,000 of its stock, and upon the next 400,000, 1/20 of 1 per cent. For each $1,000,000 above $500,000, it was required to pay $200 additional. The telegraph company made application to the secretary of state and deposited the application fee of $25, but refused to pay the charter fee, which amounted to $20,100, and continued doing business in the state.

The contention of the company was that the statutory requirement was a regulation which, by its necessary operation, directly burdened interstate commerce and involved the taxation of the company's interstate business everywhere, and also the property employed by it beyond the limits of the state, thus depriving it of its property without process at law. The court upheld these contentions, holding the Kansas regulation to be unconstitutional and void. Concerning the Kansas statutes, the court said, "It strikes at the company's entire business wherever conducted, and its property wherever located." Further it is said, "The exaction is for every practical purpose, a tax both on the company's local business in Kansas, and on its interstate business, or on the privilege of doing interstate business." In other words, the defect of the statute was held to be that the state had not chosen to ascertain what part of the fee was to be attributed to intrastate business and what part to interstate business. Western Union Tel. Co. vs. Kansas, Adv. Ops., Oct. term, 1909. See also 75 Kan. 609; 90 Pac. 299.

Power of City "To Regulate Streets" Interpreted.

The Cumberland Telephone and Telegraph Co. brought suit in the circuit of the United States to restrain the city of Owensboro from putting in force an ordinance of its common council, passed in August, 1908, regulating the charges for telephone service in that city. The company constructed its plant under an ordinance of the city, passed December, 1889, and maintained and operated it ever since that time. Its rates for business service range from $2.50 per month to $3.75, and its residence rates from $1.50 to $2. The ordinance of 1908 limited the rate for business telephones to a maximum of $2.50 per month and for residence telephones to $1.50 per month. The bill of complaint charged that the rates fixed by the 1908 ordinance were unreasonable, unjust, unfair and confiscatory; that if enforced they would deprive the company of its property without due process of law and without just compensation. It was also charged that the ordinance of 1889 was a contract, and that the ordinance of 1908 impaired the obligation of that contract. The company claimed that the city had power to pass the ordinance of 1889 under a legislative grant to it of authority "to regulate the streets," etc. Concerning the word "regulate" the court said it imported the power to control the use of the streets and was a word of wider import than "control" or the power to "consent" to an easement of way. Under this authority, the court held that the city had power to grant the ordinance of 1889 and that it was a binding contract. The later ordinance was therefore invalid. The order granting a preliminary injunction was accordingly affirmed. City of Owensboro vs. Cumberland Tel. & Teg. Co., 174 Fed., 739.

Discounts to Cities, Charitable Institutions and Ministers Sustained in New York.

The right of the New York Telephone Company to allow discounts of 25 per cent from the regular schedule rate for local messages charged to the city of New York, incorporated charitable institutions and clergymen went before the Appellate Division of the Supreme Court in a claim against the Siegel Cooper Company for service since January 1, 1908, amounting to $35,928. The store was to pay $17,052 a year for 320,000 local messages, and quit paying when it heard about the discount. Justice Dowling, writing the opinion, says that there is no statutory prohibition of the granting of discounts by telephone companies in the state and there has been no adjudication directly on this point, although decisions which originally applied to common carriers have been extended to gas and electric companies and all public service corporations and apply with particular force to such as have a monopoly. He quotes many court decisions on that point and says it may be deducted from them that "what is prohibited is the exercise of unfair and unreasonable discrimination as between those so situated that the conditions or circumstances are identical. It is difficult to imagine any ground upon which the consideration extended to the three particular classes enumerated can be held to be unfair, unjust or unreasonable discrimination against anyone," continues the court. "It is a matter of common knowledge that under modern commercial conditions the use of the telephone is an essential adjunct to the satisfactory transaction of business. Clergymen, charitable institutions and the municipality are not competitors or rivals in business of the defendant. What helps them does not damage it."

The court fortifies its conclusion by quoting from the public service commissions' law, which provides among other things that common carriers may give free transportation to ministers of religion, inmates of hospitals, charitable and eleemosynary institutions and persons engaged exclusively in charitable and eleemosynary work, indigent and homeless persons and the agents accompanying them when sent by charitable societies, as well as give free or reduced rate transportation of persons or property for the United States, State or Municipal Governments. New York Telephone Company vs. Siegel Cooper Company (N. Y.) Northeastern reporter.

Telephone Girl Gets Damages for Defamation.

The suit of Miss Minnie Pinson, a telephone operator at Munford, Tenn., against W. Cohen, a former merchant at Tipton, for slander and defamation of character, tried before the Circuit Court at Covington, has resulted in a verdict for $2,250 rendered against Cohen. Cohen, becoming enraged because the operator failed to put him in connection with Atoka as soon as he wished, hung up the receiver and turned to a number of men in his store, and, it was charged, reviled the operator in slanderous terms. This he denied, but the proof of the plaintiff was to the contrary.

A Two-Battery Two-Circuit Arrangement And Its Application

By Arthur Bessey Smith, E. E.

The following question has been received for solution and as it involves a principle which is useful in electrical arts a full explanation will be given.

"Will you kindly print in TELEPHONY an answer to the following and decide a dispute? (See Fig. 1A enclosed, which explains itself.)

"I claim, when an ammeter is inserted between B and C it will show a current of one ampere whether connection BE or CE or both BE and CE are opened. Also that an ammeter inserted between B and E will show no current as long as BC is closed."

We will say to begin with that the writer of the query is correct in his conclusions. The reasons will be set forth in the following discussion:

The various conditions are clearly seen from the following table:

Condition 1.	*B-E* removed	(Ammeter
Condition 2.	*C-E* removed	(in
Condition 3.	Both *B-E* and *C-E* removed	(*B-C*
Condition 4.	*C-E* open, *B-C* closed, ammeter in *BE*.	

In Fig. 1B we have shown the arrangement of Condition 1. It must be assumed that in all cases the connecting wires and ammeter have negligible resistance. Hence, we can divide Fig.

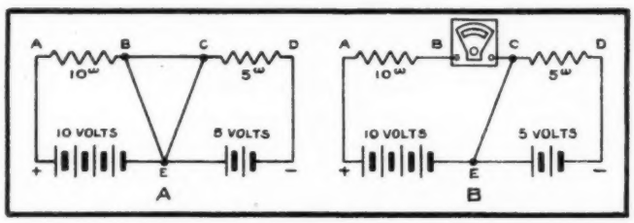


Fig. 1. A, The Problem; B, Condition 1.

1B into two separate circuits as in Fig. 2A. Now it is clear that the left-hand circuit will have one ampere flowing in it, for

$$I = \frac{E}{R} = \frac{10}{10} = 1 \text{ ampere.}$$

Since the connecting wires are of zero resistance, we may tie these two circuits together anywhere between *C* and *E* or even weld the two wires *CE* and *C'E'* together from end to end without affecting the current flow in either. Hence in Condition 1 (Fig. 1B) we have one ampere through the ammeter.

Condition 2 is shown by Fig. 2B, *C-E* being removed and *B-E* (a wire of no resistance) left in. This is the same as Condition 1 except that the current in the right-hand circuit alone is measured by the ammeter. This will be

$$I = \frac{E}{R} = \frac{5}{5} = 1 \text{ ampere.}$$

Again we have two circuits which are joined, but do not affect each other because of the negligible resistance of the common wire *B-E* which is between them.

Condition 3 is shown in Fig. 3A, both *B-E* and *C-E* being removed. This is a simple circuit with a total voltage of 15 volts and a total resistance of 15 ohms. Again we have

$$I = \frac{E}{R} = \frac{15}{15} = 1 \text{ ampere.}$$

Condition 4 is illustrated by Fig. 3B, the ammeter being connected from *E* to the point *B-C*. The latter is shown as a single point instead of a wire because we are considering the wire *B-C* to have negligible resistance, so that it makes no difference where the ammeter is connected, whether to *B* or *C* or any point between. This case comes under a law which is

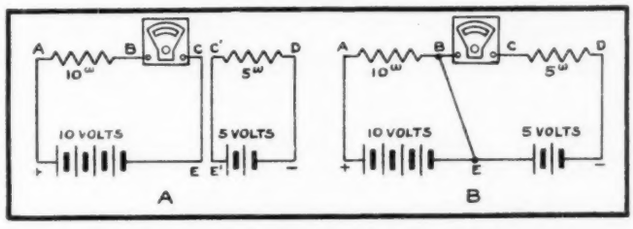


Fig. 2. A, Condition 1, Modified; B, Condition 2.

well known in electrical science, that if in such a circuit the resistances *AB* and *CD* be in the same proportion as the corresponding voltages no current will flow between *B-C* and *E*. The above relation may be stated thus:

$$\frac{\text{Resistance } AB}{\text{Resistance } CD} = \frac{\text{Voltage left-hand battery}}{\text{Voltage right-hand battery}}$$

or "Resistance *AB* divided by resistance *CD* equals voltage left-hand battery divided by voltage right-hand battery."

To see that this is true, suppose that the ammeter of Fig. 3B be removed. Also let us call the negative end of the 5 volt battery zero potential. Then point *E* is 5 volts higher in potential than point "—." Point "+" is 10 volts higher in potential than *E* and 15 volts higher than point "—." This is due to the electro-chemical relations which exist in the cells of battery. The battery is a builder up of electrical potential. Now, in the external part of the circuit (*A* to *D*) we have a steady flow of current and the electrical potential is falling as we progress from *A* to *D*, so that when we have arrived at *D*, which is joined to "—," we are again at zero potential. While the battery is a builder up of potential (a creator of energy) the external resistance lowers the potential (is a dissipator of energy). Since point *A* is 10 volts above *D* and the potential falls from *A* to *D*, there must be a point in between at which the potential is 5 volts above *D*. But *E* is also 5 volts above *D* (or "—"). Hence that point between *A* and *D*, and the point *E*, are at the same potential and a wire connected between them will not carry any current. How shall we find this point?

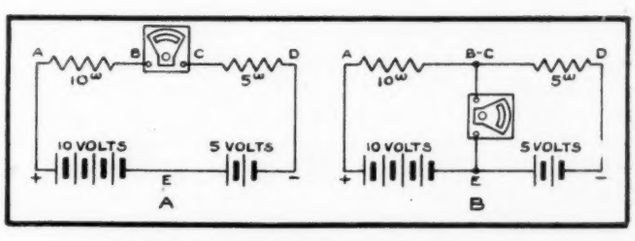


Fig. 3. A, Condition 3; B, Condition 4.

We know from Ohm's law that the current in the circuit is one ampere, as previously calculated. By knowing the current through any coil and the voltage of difference of potential across its terminals we can calculate its resistance.

How much resistance must there be between *D* and the

imaginary point which is to be 5 volts above *D*? Again Ohm's law (in another form) comes to our aid.

$$I = \frac{E}{R}$$

We can multiply both sides of this equation by the same number without unbalancing it. Hence,

$$R \times I = \frac{E}{R} \times R, \text{ or } R \times I = E.$$

Again we can divide both sides of an equation without unbalancing it. Hence,

$$\frac{R \times I}{I} = \frac{E}{I}, \text{ or } R = \frac{E}{I}.$$

Now, in this case (Fig. 3B with ammeter removed) we have one ampere for I and 5 volts as the desired E. Hence,

$$R = \frac{E}{I} = \frac{5}{1} = 5 \text{ ohms.}$$

Hence, there must be 5 ohms between *D* and the supposed point which is 5 volts above *D*. But the resistance of the coil from *B-C* to *D* is just 5 ohms. Hence point *B-C* is 5 volts above *D*, the same as *E* is, so that *B-C* and *E* are at the same potential. Hence any wire or instrument may be connected from *B-C* to *E* without any current flowing through it.

Practical Applications.

The Edison 3-wire system of electric lighting is a good example of this principle. Fig. 4A shows it in simplified form.

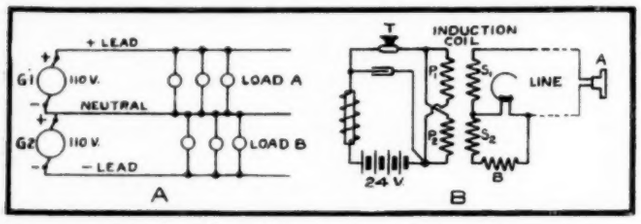


Fig. 4. A, Edison Three Wire System; B, Anti-Sidetone Operator's Set.

G_1 and G_2 are two direct current dynamos connected in series, the positive terminal of G_2 being attached to the negative terminal of G_1. The line wire called positive runs from the positive terminal of G_1 to load *A*, the negative line from the negative terminal of G_2 and the neutral line from the point between G_1 and G_2. Each dynamo generates approximately 110 volts, and if the loads *A* and *B* are equal, no current will flow in the neutral wire.

The anti-sidetone operator's set used by some telephone companies works on the same principle. It is shown simplified in Fig. 4B. The induction coil has two primary windings, P_1 and P_2, each with its own secondary, S_1 and S_2. This is done so that the voltages generated in each secondary shall be equal and of the same wave form or shape. *A* is the telephone to which the operator is talking. *B* is a resistance in the operator's set. *A* and *B* correspond to the two loads *A* and *B* of Fig. 4A, while S_1 and S_2 take the place of the two generators. The operator's receiver, *R*, is in a place corresponding to the neutral wire.

If the operator talks to the other person two voltages are generated, one each in S_1 and S_2. Each forces current through its own load; S_1 through *A* and S_2 through *B*. If the voltages and loads are proportional to each other, no current will flow through *R* and the operator will not hear her own voice in her own receiver. In practice it is impossible to get exact results, but the current in *R* is sufficiently small not to annoy the operator.

Trouble in Ringing Central.

We have a farmers' line with 16 bridging telephones with 2500 ohm ringers, condenser in the receiver circuit. Subscribers are all located close together in one neighborhood, with a wire about 14 miles long running from these subscribers to the switchboard. Our line is a grounded circuit, No. 12 B. B. iron wire. About a month ago one subscriber complained that he could not ring central. I inspected his telephone carefully but can find nothing wrong with it. Have also connected the generator to a 110 volt electric light bulb and it lights up brightly when the crank is turned, showing that the generator is not weak.

I would like your opinion in the next issue of Telephony as to where the trouble is, and how to remedy it.

The telephone in question will ring all the other telephones on the line perfectly. Until about a year ago we had 22 telephones on our line and did not have as much trouble in ringing central as we have now. Six new subscribers wanted telephones, so we divided our line, putting 12 on one and 16 on the other. For ten miles out of "Central" they occupy the same poles, 12 inches apart. The people operating the switchboard furnished a wire about 10 miles out and we built our line to meet them. When we divided our line we requested them to furnish us another wire out to that place. They let us have an old line which they had bought from another company and we connected it. Since then we have had our trouble. The 12 telephones on the other wire have no trouble. Do you think that the wire being about 15 years old has anything to do with it? The coils on the switchboard are 1600 ohms. Would less resistance help us any?

Your trouble is probably due to the old line. A wire which at this time has been up fifteen years is likely to be in bad shape due to high resistance joints. Galvanized wire made that long ago is not of as good quality as that made now, and its joints more subject to rust. The modern process of galvanizing produces a coating of zinc which adheres very closely even in the severe operation of splicing and in a rural region will last a very long time.

Have the old line measured up from central to the point at which you join, and if it shows high resistance have a new one put up. It should have earned its worth by this time, anyway.

A lower resistance drop winding will not help you.

More Wireless "Bunk."

What the wireless telephone promoters won't say in their effort to amass ill-gotten gains from credulous investors has not yet been shown. A sample of the nonsense they do retail, and which they succeed in getting into reputable papers, is the following, from the Minneapolis *Tribune:*

"Solid steel, masonry, woodwork and distances will be annihilated in Minneapolis by that strange, uncanny and somewhat spooky force known as the wireless telephone, which will be installed in this city by the Radio Telephone Company, according to Lorne F. Bell and J. H. Smith of Victoria, B. C., Canadian managers of the company, who are at the West Hotel. They plan an experimental station.

"'The wireless telephone, which was considered an experiment for many months, has been proved a success,' said Mr. Bell.

"'The only trouble with the system has been to properly gauge the telephones. This defect has now been corrected. It was discovered that if the number of vibrations transmitting from the 'phones were changed only those which were tuned to the same pitch would respond to each other. Our plan is to have every instrument tuned differently and each telephone will have a number which will correspond with its own vibration. There will be a dial on the telephone and by working a hand, as on a clock, it can be brought to the pitch of the 'phone wanted and you can talk without molesting any other instrument.'"

Dr. De Forest, the inventor of the Radio telephone, is having his name coupled with some mighty curious financing and publicity these days. In time the public will become educated to the limitations of the wireless. The article recently published in TELEPHONY shows the liability of the wireless to interference, and the impracticability of tuning to enable a large number of messages to be transmitted simultaneously.

Among the Companies

Conventions, Kansas, Topeka, April 26, 27, 28; Missouri, St. Joseph, May 3, 4 and 5; Indiana and Michigan, South Bend, Ind., May 11, 12

Strong Program for Kansas Convention.

Governor Stubbs of Kansas, Frank H. Woods, president of the National Independent Telephone Association, Theodore Gary of Macon, Missouri and F. R. Jackson, attorney general of Kansas, and other men of prominence will be among the speakers before the Kansas Independent Telephone Association at its annual convention at the Throop Hotel, Topeka, next week.

Business matters of interest to all companies and the strong program for a practical session will make it to the interest of every telephone investor and every man holding a responsible operating position to attend this meeting. So large a number have already signified their intention of being present that it is to be the greatest telephone convention the Kansas Independent men have ever held.

The program committee has worked hard and intelligently, and has been promised the co-operation of a large number of men. It is expected that all who attend the practical session will want to make it an occasion for a free give and take exchange of experiences, where every man will have a chance to ask questions and swap ideas with everybody else in an informal way, so that each one may go home with the benefit of the experiences of all who get together at these meetings.

This is a new feature of the Kansas conventions and promises to be fully as interesting and helpful as any of the other sessions. The proprietors and managing officers are particularly invited to arrange matters so that their men at the heads of the different branches of work can attend the meeting, and get ideas which can be put into practical effect and make possible economies in management during the coming year. Following is the program in full:

First Session.

Tuesday evening, April 26, 7:30 P. M.

Social session and smoker, parlor, Hotel Throop.

Second Session.

Wednesday, April 27, 9:00 A. M.

Meeting Called to Order, Hotel Throop.

Address of welcome, T. A. Borman, president of the Commercial Club, Topeka; response, Chas. Morris, Holton; president's address, W. P. Hemphill, Topeka; report of secretary and treasurer, A. B. Clarke, Lawrence; appointment of committees; announcements.

Third Session, Practical Session.

Wednesday, April 27, 2:00 P. M.

"Little Things that I Have Learned in the Telephone Business," J. D. Joseph, Whitewater; "How to Reduce Maintenance," R. B. Fegan, Abilene; "Fight Upon Independent Telephone Securities," J. C. Kelsey, Chicago; "Importance of the Right Attitude of Employees Toward Service," W. K. McQuoin, Atchison; "Systematizing, Recording and the Cost of Trouble," A. J. Page, Abilene; "Cable Construction For Small Plants," L. Robinson, Galena.

Fourth Session.

Thursday, April 28, 9:30 A. M.

Topics for discussion.

Business meeting of the Association.

"Advantages to Independent Telephone Companies of a Public Utilities Bill."

"A new Plan of Organization for The Kansas Independent Telephone Association."

"Relation of the Kansas Independent Telephone Association to The National Independent Telephone Association."

"Would the Value of Independent Telephone Securities Be Increased by The Close Organization Of Independent Telephones Companies?"

Speakers, Governor W. R. Stubbs, Topeka; Theodore Gary, Macon, Mo.; Frank Woods, Lincoln Neb.; Fred R. Jackson, Atty. Gen., Topeka; R. E. Mattison, Lincoln, Neb.; A. A. Goddard, Topeka.

Fifth Session.

Thursday, April 28, 2:00 P. M.

Practical Session.

"Transmission," C. J. Meyers, Supt. K. C. Long Distance Tel. Co., Kansas City, Mo.; "Phantom Circuits for Small Companies," Fred Colson, Kansas City, Mo.; "Organization and Future of Practical Sessions," Franklin H. Reed, Editor TELEPHONY, Chicago; "What Shall Constitute Adequate Maintenance," W. E. A. Nottorf, Topeka; "Party Lines—In Cities, On Rural Lines," H. W. Sexton, Wichita.

Five minute talks about local conditions, J. A. Zimmerman, Valley Falls, H. L. Pierce, Belleville, Walter Moxley, Norton Ville, H. E. Baker, Overbrook, C. A. Sloan, Pratt, W. G. Yullos, Rantoul, Robert Burns, Hutchinson, T. L. Youmans, Osawatomie, A. H. Manning, McLouth, H. A. White, Baldwin, C. L. Brown, Abilene, U. S. Hannum, Ottawa, W. H. Nelson, Smith Center, Ralph Shove, Winchester.

Public Utility Corporation Oppose Woods Bill in Ohio.

Because of a movement on the part of the Ohio house of representatives to adjourn May 10, it is likely that the Woods public utilities bill, which is now pending in the senate after passing the house, will come before a conference committee to be appointed by the presiding officers of the two houses later in the session. There are a number of provisions in the bill as it has passed the house which are not agreed to by many of the members of the senate and it is believed that a conference committee will be the best method of straightening out the matter. A number of the other big bills will go before the same conference committee.

Corporations in public utilities other than the telephone are opposed to the bill in its present form. Just as the supporters of the bill had finished counting noses, as it were, in the senate, a combined opposition appeared. The mail boxes of the senators were stuffed with letters of protest against haste in bringing the bill to a vote. Many did not ask for the defeat of the bill, but they asked for time in considering the matter. Telephone men asked for a hearing to be given especially to telephone companies on the phases of the bill which affects the operation of telephone concerns.

Many corporations are organizing to oppose the measure and it is believed there is some doubt if the bill will pass, especially in its present form.

Bell Connection at Crestline May Not Violate U. S. Telephone Co. Contract.

An officer of the United States Telephone company, of Ohio, informs TELEPHONY'S correspondent that the statement that the Crestline Independent telephone company has admitted Central Union long distance connection is true. When asked if it is was not true that the United States company had an exclusive connection contract with the Crestline concern, he said that there was some question of the validity of this particular contract.

It is true that the U. S. has a contract with the Crestline company which is believed to be exclusive, but the officer interviewed says that as it was given to a predecessor of the U. S. it may not be good in the courts.

The U. S. company is testing the matter now in a number of suits that are pending, and no new suit will be filed in the Crestline case. The same points are at issue as are contested in the case at Van Wert and at Marion. At Van Wert attorney D. J. Cable of Lima recently argued the case again before the circuit court and a decision is expected soon. Upon this decision will depend the action to be taken by the U. S. officials in the Crestline case.

New York Bill for Telephone Regulation.

Assemblyman Merritt in the Assembly and Senator Davis in the Senate have introduced a bill to place the telephone and telegraph companies operating within the state of New York under the jurisdiction of the Public Service Commission, Second district. The proposed act is to go into effect on September 1.

Among the provisions which the bill has are powers granted to the commission to compel telephone and telegraph companies operating within the state to give safe and adequate service, and compelling just and reasonable charges, filing of rate schedules with the commission, filing of reports, and empowering investigations of rates, rentals, service, ordering repairs and changes, supervision over franchises and privileges, and transfers of stocks and bonds.

Detroit River Company to Spend $20,000 on Two Exchanges.

The Detroit River Telephone Co. has let contracts for equipping its Trenton and Wyandotte exchanges. The company will spend $20,000 in improvements and work will be started in the early spring months, with the expectation that it be completed by August 1. The company, which is less than a year old, now operates 1,200 telephones in Wyandotte, Ecorse, Ford, Trenton, Grosse Ile, Flat Rock and the surrounding country. It outnumbers the Bell about 4 to 1.

Henry Roehrig, vice-president of the company, said to TELEPHONY's representative: "Our company has been a most prosperous one. Although we have been in the district less than a year and though we encountered opposition both from the Bell and municipalities, we have overcome all obstacles and we now outnumber the opposition almost 4 to 1."

The contracts for the equipment were let some two weeks ago, and it will be delivered shortly.

Indiana Tax Hearings.

A. E. Holcomb, of the American Tel. & Tel. Co., is reported as having stated before the Indiana tax commission, that the rate of depreciation for the long distance system in Indiana is 5 per cent. He testified that the cost of operating Indiana plant, which is assessed at $1,686,600, was $151,000; and that of the maintenance account $125,000 represented depreciation. Net earnings were stated at $116,000 last year.

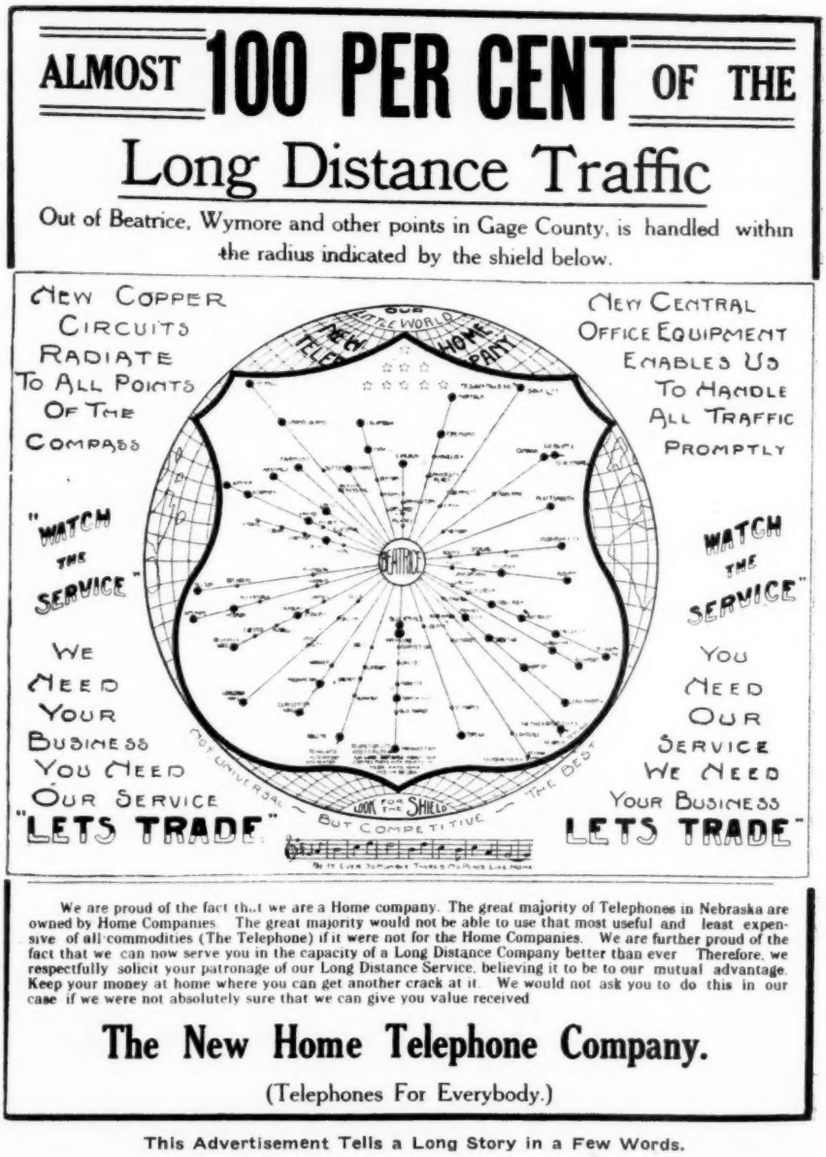
C. S. Norton, secretary and treasurer of the Indianapolis Telephone Company and the New Long Distance Telephone Company, was before the board asking a reduction in the tax on those plants. The depreciation in the Indianapolis plant each year was placed at about $80,000. Mr. Norton said within the last year the company had spent $220,000 for equipment and that the greater part of the money had gone for replacements, new wire being a large item. He asked that the plant be placed at a valuation of $50,000, a reduction of $50,000.

Cumberland "Melon Cutting" Rumors Offset Poverty Pleas Urged Against Rate Reductions.

Stockholders of the Cumberland Telephone and Telegraph Company have been hearing rumors to the effect that a "melon" is to be cut by that company, although in its efforts to evade regulation by municipalities in which it is doing business it has uniformly made the plea of poverty. It is stated that a bonus in the form of extra dividends or rights on a new issue of stock will be the mode of cutting the melon.

Long Distance Advertising From a Progressive Exchange.

Business men of Beatrice, Neb., recently had the long distance facilities of their Independent company called to their attention by a striking full-page advertisement in the newspapers. This advertisement, which is here reproduced, contains many elements of strength, and is well worth studying. Mr. W. H. Caman, manager of the company, is a hustling business man himself, and knows how to build up his long distance traffic, and take care of it after he gets it. Furthermore he is one of the most diligent of the earnest workers for the success of the Independent system of Nebraska.


ALMOST 100 PER CENT OF THE
Long Distance Traffic
Out of Beatrice, Wymore and other points in Gage County, is handled within the radius indicated by the shield below.
NEW COPPER CIRCUITS RADIATE TO ALL POINTS OF THE COMPASS
"WATCH THE SERVICE"
WE NEED YOUR BUSINESS YOU NEED OUR SERVICE
"LETS TRADE"
NEW CENTRAL OFFICE EQUIPMENT ENABLES US TO HANDLE ALL TRAFFIC PROMPTLY
"WATCH THE SERVICE"
YOU NEED OUR SERVICE WE NEED YOUR BUSINESS
"LETS TRADE"
BEATRICE
OUR LITTLE WORLD
NEW TELE
HOME PARTY
NOT UNIVERSAL — BUT COMPETITIVE — THE BEST
LOOK FOR THE SHIELD
We are proud of the fact that we are a Home company. The great majority of Telephones in Nebraska are owned by Home Companies. The great majority would not be able to use that most useful and least expensive of all commodities (The Telephone) if it were not for the Home Companies. We are further proud of the fact that we can now serve you in the capacity of a Long Distance Company better than ever. Therefore, we respectfully solicit your patronage of our Long Distance Service, believing it to be to our mutual advantage. Keep your money at home where you can get another crack at it. We would not ask you to do this in our case if we were not absolutely sure that we can give you value received
The New Home Telephone Company.
(Telephones For Everybody.)

This Advertisement Tells a Long Story in a Few Words.

Program for Convention of Railway Telegraph Superintendents

The twenty-ninth annual convention of the Association of Railway Telegraph Superintendents will be held in Los Angeles, Cal., June 20 to 24, inclusive, 1910, at the Hotel Alexandria.

The program for the convention includes the following papers: "Wireless Telegraphy," Mr. William Maver, Jr.; "Education for Efficient Railroad Service," D. C. Buell; "Protecting Telephone Lines from Lightning and Other Disturbances," M. E. Launbranch; "Automatic Block and Highway Crossing Signaling," H. P. Ryner; "Telephone Train Dispatching," E. E. Dildine; "Testing of Telegraph and Telephone Circuits," V. T. Kissinger; "Telephoning to and from Trains," E. P. Griffith.

The committee on arrangements has not overlooked the importance of social features and there will be sufficient recreation and pleasure intermingled with the work of the convention to make the trip one of unusual benefit and interest.

The transportation committees have been favored with many courtesies by the railroads, and while these favors apply to active members only, owing to the Interstate Commerce Laws, associate members and invited guests are invited to avail themselves of the opportunity to accompany the party in a body, leaving Kansas City at 11:30 a. m., Wednesday, June 15, via the Santa Fe route. Those who expect to attend are requested to advise Secretary P. W. Drew by May 20, of the names of those contemplating the trip, in order that accommodations may be provided for all.

Pittsburg Bell Company Merged With Other Units.

Important changes in the organization of the Central District and Printing Telegraph Company were put into effect April 1, when the company became a member of a group of five associated Bell companies operated under one executive head, with general offices at Philadelphia.

Martin H. Buehler, formerly general manager of the Central District and Printing Telegraph Company, has been transferred to Philadelphia, where he assumes the duties of auditor of the group of associated companies.

Under the new organization the various departments will be represented in Pittsburg by M. C. Rorty, division commercial superintendent; S. P. Grace, plant superintendent; F. T. Ewing, traffic superintendent; J. H. Boeggeman, assistant auditor, and G. L. Herron, assistant secretary and assistant treasurer.

Eastern Illinois Convention.

Members of the Eastern Illinois Telephone Association held a very beneficial meeting on April 19, at Marshall, Ill. J. W. Coffey of Indianapolis addressed the members explaining the merits of the clearing house. W. C. Drysdale of Charleston read a paper on the Evils of Free Service, and J. C. Kelsey of Chicago talked on Reserves, Profits, and Financial considerations generally.

Among those present were, C. W. Shimel, president, Casey, Ill., Roy W. Hall, secretary, Westfield; Dr. Gumpkin, Mattoon; H. H. Knipe, Toledo; T. C. Ainsworth, Paris; A. G. Maxwell and James Hardacre of Lawrenceville; A. E. Newton of Hudsonville; A. E. Baker of Marshall, and A. L. Staderman of Terre Haute, Ind.

St. Louis Bell Company Withdrawing Nickel Prepayment Service from Residences.

Nickel-in-the-slot telephone instruments are being removed from St. Louis residences by the Bell company.

"While we shall not, of course, do away with the slot telephones in stores," said an official, "we have decided to remove them from residences with all expediency. We have a rate of $3 a month for two-party lines and of $4 a month for direct lines in the residence service, and we are superseding the 'per message' rate of the slot telephones by these flat rates. It is only a question of a comparatively short time before all lot telephones will be removed from residences."

Cumberland Kicked Out of Shelbyville, Kentucky.

The Cumberland Telephone & Telegraph Company has been kicked out of Shelbyville, Ky. The Business Men's Association held a meeting last Saturday and adopted a resolution in favor of using the Home telephone exclusively, and the Cumberland company has been so notified. It is not believed that the company will continue to do business there under the conditions. Trouble arose when the Cumberland announced a raise in rates effective April 1, but this was rescinded following a protest by the business men. The Cumberland would not make an agreement to maintain the present rates, however, and the action taken by the association was the direct result of this attitude on the part of the company.

Kansas City Independents Earning 12.15 Per Cent on Outstanding Stock.

The Kansas City Home Telephone Company and the Kansas City Long Distance Telephone Company have issued a combined report for the year ended March 31, 1910, which compares as follows:

Gross earnings	$1,246,026	$1,100,081
Expenses	667,849	590,209
Net earnings	$ 578,177	$ 509,872
Interest	213,501	204,537
Surplus	*$ 364,676	$ 305,335

*Equal to 12.15 per cent earned on $3,000,000 capital stock outstanding.

New Bell Corporation in the Southwest.

The Tri-State Telephone Company, a new subsidiary of the Bell telephone company, has just been organized to take over the company in Arizona, New Mexico and West Texas. The new company has headquarters in Denver, but the operating headquarters are located in El Paso. Lines will be extended at once to Tucson, Bisbee, Douglas, Tombstone, Globe and Phoenix, in Arizona, and later to Los Angeles. The announced policy of the company is to cover the two territories with a network of toll lines and exchanges.

206 Calls for Taft Breaks Branch Exchange Traffic Record.

Two hundred and six telephone calls for President Taft were answered during his recent stop of one day at the La Salle Hotel, Chicago. The calls ranged from a desire to "speak to Mr. Taft" to a request that "my compliments be given the President, for I knew him in Ohio."

"The calls could not be delivered, of course," said Clerk Smith, "and I had to pacify the callers the best I could, and when I told them the President could not answer, it made them mad, and when I said 'Yes, this is Mr. Taft,' their joy was evidenced in their voices.

"It was a great strain and the record of 206 calls for one man in one day and evening I believe is a record—certainly here."

No Change in U. S. Telephone Directorate Expected at Annual Meeting.

Notices of the annual meeting of the stockholders of the United States Telephone Company which will be held in Cleveland, Ohio, April 25 have been sent out. This will be the last meeting to be held in Cleveland, as an amendment to the by-laws will be offered and adopted providing for holding the annual meetings in Columbus in the future. It is announced that there will be no changes in the officers and board of directors from the reorganization made since the majority of the stock was acquired by J. P. Morgan and Co., All of the offices have been removed to Columbus and only a temporary office is retained in Cleveland.

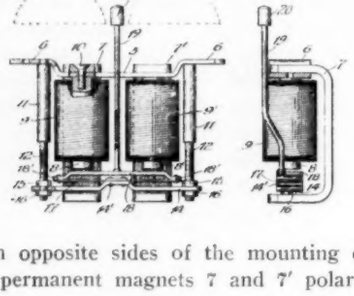
Work of the Inventors

Conducted by Max W. Zabel

RINGER.

P. C. Burns, Chicago, Ill., pat. 954,167, April 5, 1910.

The harmonic ringer of this patent has a tuned spring 17 fastened to the yoke 14. The spring 17 carries an armature



18 fastened on opposite sides of the mounting of said tuned spring. Two permanent magnets 7 and 7' polarize the armature.

BATTERY HOLDER.

C. T. Mason, Sumter, S. C., pat. 954,119, April 5, 1910, assigned one-half to G. C. Warren, Sumter, S. C.

A battery holder is here shown which has springs mounted thereon. Each spring has two arms, one being of such construction as to contact with the zinc plate and the other arm adapted to contact with the carbon plate so that the batteries are merely placed in position. The spring arms make the connection whereby a plurality of batteries can be properly connected in circuit.

CABLE HANGER.

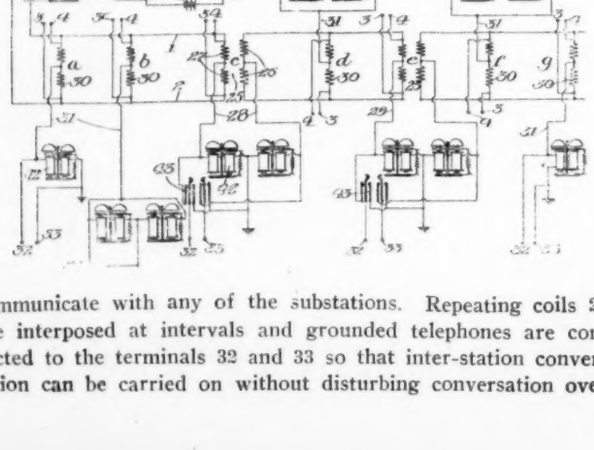
R. W. Hubbard, Ashabula, O., pat. 953,951, April 5, 1910.

This cable hanger has a double loop somewhat in the form of a W, for placing on the messenger wires. The marline loop is then hung over one leg of the hanger and coiled around the cable. The ends are wedged between the double end of the other leg of the hanger.

TELEPHONE SYSTEM.

O. M. Leich, Genoa, Ill., pat. 954,445, April 12, 1910, assigned to Cracraft, Leich Electric Co., Genoa, Ill.

The system disclosed in this patent is for use along railway lines and consists in having bridged telephones connected to the terminals 3, 4 so that the train dispatchers' telephone *h*, can



communicate with any of the substations. Repeating coils 25 are interposed at intervals and grounded telephones are connected to the terminals 32 and 33 so that inter-station conversation can be carried on without disturbing conversation over the metallic circuit. Polarized ringers are provided to give inter-station signal service.

CONNECTOR.

J. C. Vogel, Philadelphia, Pa., pat. 953,934, April 5, 1910.

The electrical connector for wires disclosed in this application consists of two plates, on their opposite sides having opposite extending and mating members, between which the wires are to be placed. Means are provided in connection with the two plates to further help secure the connection with the wire.

COMBINED JACK AND RESTORING DROP.

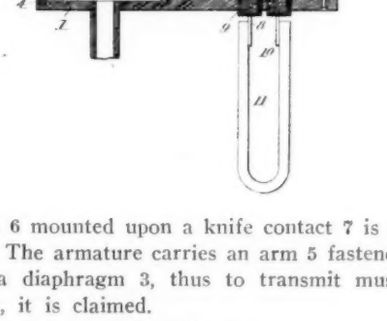
E. J. Grenier, Menominee, Mich., pat. 954,624, April 12, 1910,

A magneto drop is set forth in this application in which the armature and shutter rod are mounted on a swinging bracket which can be moved out of the way to permit withdrawal of the coil. The drop connections also are at the rear and screw-threaded so that the drop can be mounted in place and secured to a back plate by means of nuts which make contact with clips provided for that purpose.

RECEIVER FOR SOUND-TRANSMITTING INSTRUMENTS.

J. J. Comer, Santa Monica, Cal., pat. 954,931, April 12, 1910, assigned to G. R. Webb, Baltimore, Md.

A sound transmitter having a permanent magnet 11 actuating



a diaphragm 6 mounted upon a knife contact 7 is described in this patent. The armature carries an arm 5 fastened by means of wax to a diaphragm 3, thus to transmit musical sounds more clearly, it is claimed.

TELEPHONE.

J. E. Rogers, Danbury, Conn., pat. 954,701, April 12, 1910, assigned to F. H. Lee, Danbury, Conn.

This telephone instrument is designed for use with one transmitter and two receivers in a unitary structure, all of which are mounted on a hollow stem in which the circuit changing springs are mounted. The act of raising the receivers to the ears actuates these springs.

COMBINED TELEPHONE AND TELEGRAPH SYSTEM.

G. E. Hines, New York, pat. 954,734, April 12, 1910, assigned one-half to W. T. Daley, Brooklyn, N. Y.

This invention is designed to overcome the effect of having telegraph impulses affect telephones connected to the same line, being here shown as applied to a grounded conductor. The conductor at one end has a coil in series and a second coil in inductive relation to the first coil, a closed magnetic circuit being provided for the coils. A telegraph key and battery are in series with the second coil and an impedance coil is located in the ground connecting between the first coil and the point to which the telegraphic apparatus is connected, thereby to round the wave form of the telegraphic current.

Factory and Sales

A New Transmitter Mouthpiece.

A transmitter mouthpiece has just been placed on the market by the Kellogg Switchboard & Supply Co., Chicago, Ill. This mouthpiece has a perforated steel shell covered with a coating of hard rubber moulded over it at great pressure and heat. As the rubber is forced through the perforations and around the shell, it makes, it is claimed, an absolutely unbreakable mouthpiece.

The threaded portion is made directly on the steel at the base, eliminating danger of breakage at this point.

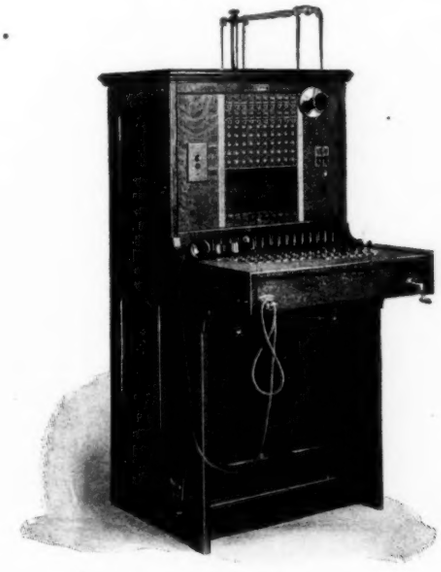
This mouthpiece does away with the expense due to the replacing of broken mouthpieces. The coating of hard rubber eliminates the possibility of danger from electricity due to crossed wires or other sources.

The No. 10 Dean Switchboard.

A new type of switchboard, known as the No. 10, has recently been placed on the market by the Dean Electric Company, Elyria, Ohio. The board is equipped for 50 common battery lamp signal and 20 magneto combination drop and jack lines. The cord circuit is arranged for eight local, common battery connections and seven combination magneto to magneto or magneto to common battery connections. Also, there is sufficient space for 50 additional common battery lines, which are already wired in this particular cabinet, as shown in the rear view.

A push button switch is provided at the left hand side of the apparatus panel for cutting off the central battery in case of emergency or when making inspection. Two cam lever keys are mounted on the right hand side. One is used for the night alarm and the other for switching from hand generator to power generator or to a pole changer.

Accessibility and ease of inspection have been well cared for by using the Dean hinged relay rack in the rear of the

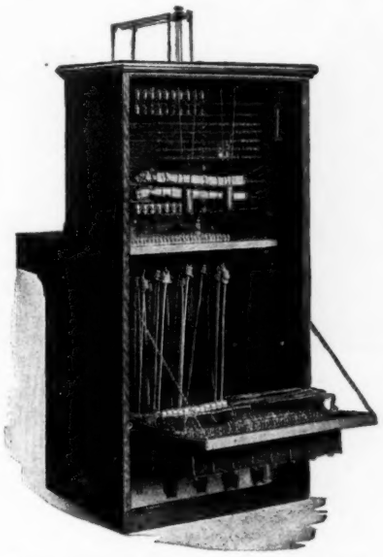


The No. 10 Dean Switchboard.

cabinet. When this rack is swung down, not only are all of the terminals of the relays, condensers, repeating coils, etc., exposed to view, but the flexible connecting cords and the cord rack terminals are very easily reached. A small panel is provided between the connecting cords and the wiring to the relay terminals so as to protect the latter from the action of the cord weights.

This rear-of-board arrangement will appeal very strongly to the experienced repair man, as it is not necessary to go to great trouble in reaching the cords and wiring to the switchboard apparatus. While making repairs the switchboard is not out of commission and service can be given over the other lines.

The board also is arranged for private branch exchange



Rear View of the No. 10 Switchboard.

service, and will accommodate as many as 200 lamp signal lines with twelve connecting cord circuits, and five plug ended trunks. In every case all of the line and cord circuit relays and other switchboard apparatus is contained in the cabinet. It is only necessary to wire from line and power terminals, at the base of the board to the distributing frame, to accomplish installation when the board is used for this service.

The Dean company has made up a large number of these switchboards for magneto service, the cabinet being nicely adapted for any equipment which will never grow to more than 100 lines or require more than 15 connecting cord circuits.

The line circuits can be provided with the Dean self-restoring drops with associated jacks while the cord circuits can have double clearing out drop supervision.

By providing the cord circuits with individual four or eight-party harmonic ringing keys, it is possible to serve a large number of telephones.

The height of this switchboard is 4 feet 3 inches, and the total width is 27⅛ inches, while the depth from the front of the key shelf to the back of the board is exactly 30 inches.

A New Book on Intercommunicating Systems.

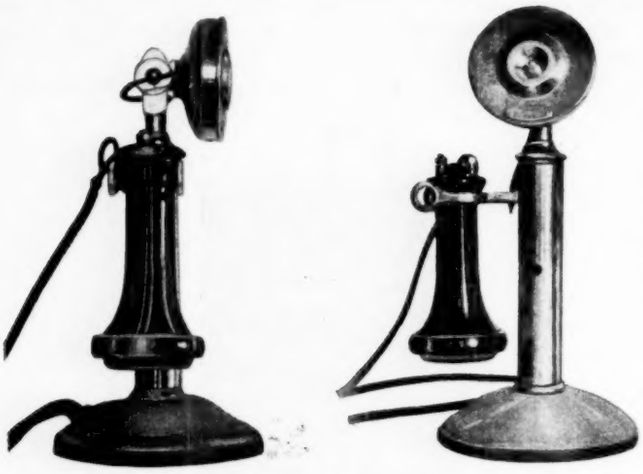
An attractive and instructive booklet going into the subject of intercommunication telephone equipment has just been issued by the Monarch Telephone Manufacturing Company, Chicago, Ill. The merits of house systems are discussed in detail, showing wherein business firms, manufacturing houses, etc., would make a considerable saving in time by installing intercommunicating systems connecting the various departments. The operation of the Monarch system is also made clear.

In the compilation of this booklet the Monarch company has endeavored to make the matter as clear as is possible, and for this reason illustrations showing the wiring of circuits of a house system in colors have been incorporated in the book. Illustrations of the various types of intercommunicating telephone sets both wall and desk, are also shown.

A New Transmitter Mouthpiece.

A report on the new transmitter mouthpiece, the patent on which was reviewed in TELEPHONY March 5, says:

"The flush mouthpiece for the transmitter used in the following test is the invention of Mr. Felix Gottschalk, New York City, and is designed for the purpose of making



Front and Side Views of Transmitter Equipped with New Flush Type Mouth Piece.

the transmitter more sanitary. It consists of an aluminum cup or mouthpiece attached to the diaphragm of the transmitter by means of the bolt and nuts used in fastening the front electrode to the diaphragm. This cup extends through the transmitter case and its outer edge is turned over so as to come nearly flush with the transmitter case. The cup fits close to the case so as to seal its interior from dust and dirt, but does not come in actual contact with the case. A cap is fitted over the nut which holds the mouthpiece in place and the interior of the case is finished so as to contain no grooves for the ready lodgement of dust or dirt, and its polished surface can be readily inspected and cleaned, should cleaning become necessary. In this respect it is an improvement over the type of mouthpiece ordinarily in use.

"The object of the tests made by the writer was to determine any effect which this mouthpiece might have on the transmission of ordinary speech over the telephone system; and a comparison was made with the Western Electric Company transmitter of the standard type and fitted with the usual rubber mouthpiece. The instrument fitted with the flush mouthpiece was also a Western Electric Company transmitter of the standard type. An artificial line was constructed consisting of sixteen sections, each section containing a resistance, inductance, and capacity corresponding to about fifty miles of telephone line as constructed of No. 9 copper wire. Any number of these sections could be used in series, thus giving the equivalent of a line 800 miles in length when all sections were in use.

"Standard Western Electric Company apparatus and connections were used and arrangements were made whereby either the standard transmitter or the instrument with the flush mouthpiece could be quickly connected into service. A series of words were pronounced into the transmitter, using an ordinary tone of voice and holding the mouth in the same relative position with respect to the mouthpiece (about two inches directly in front of it) in all cases. The judgement of the receiving operator in regard to the relative merits of the transmission with the two instruments was recorded for each length of line used and the result of the independent judgments of two sets of operators is given in Table 1, page 3. Care was exercised to select a standard transmitter which was known to be in good adjustment. The transmission at ordinary tones become weak when 500 miles of the artificial line were connected in and the tests were not carried further.

TABLE 1.
Test of Flush Mouthpiece Telephone Transmitter.

Length of line.	Transmission Standard Instrument	Transmission Flush Mouthpiece Transmitter.
0 miles	Good	Good
50 miles	"	"
100 miles	"	"
150 miles	"	No practical difference to this point.
200 miles	Fair	Good
250 miles	"	"
300 miles	"	"
350 miles	"	"
400 miles	Weak	Fair
450 miles	"	"
500 miles	Very weak	Weak

"For short lines no appreciable difference could be determined, but for lines from 200 miles in length to 500 miles in length the flush mouthpiece transmitter possessed a slight advantage, the transmission being both louder and clearer. The sense of the conversation could be obtained with the flush mouthpiece and 500 miles of line, ordinary tones, but the transmission by means of the standard instrument under these conditions was extremely weak.

"The above tests show that the flush mouthpiece in no way interferes with the use of the instrument as far as the transmission is concerned and that it even improves this transmission to some extent, but this improvement is only a slight one.

"(Signed) Geo. O. Shaad."

THE LORIMER-LUNDQUIST COMPANY is the successor of The Lorimer Automatic Telephone Company, organized in 1905 to control the Lorimer patents on a system of automatic telephony for the United States.

Recently the company acquired by purchase, from the Globe Automatic Telephone Company, the telephone patents and inventions of Frank A. Lundquist, and the name of the company was changed to The Lorimer-Lundquist Company.

This company will open offices on May 1 at rooms 524, 525 and 526, in the Monadnock Building, Chicago. The management reports that the business of the company will be vigorously developed.

PHILIP B. WOODWORTH, dean and professor of electrical engineering of the Lewis Institute, Chicago, Ill., has become associated with Rummler & Rummler, patent attorneys, 1400 Tribune Building, Chicago, and will give special attention to applications for patents on electrical inventions and to consultations in patent suits involving electrical questions.

THE DEAN ELECTRIC COMPANY, Elyria, Ohio, announces the closing of a contract for a complete common battery central office equipment, and common battery telephones for the Northern Indiana and Southern Michigan Telephone and Cable Company, of La Grange, Ind.

UNITED ELECTRIC COMPANY, Wichita, Kan., is devoting special attention to the telephone business and extending its trade territory very considerably among the telephone companies throughout the State.

GEO. A. SCOVILLE, resident engineer of the Dean Electric Co., in charge of the Pacific Coast interests, who is himself located at 156 Second St., San Francisco, has an able assistant in M. J. Corwin, who makes his headquarters at Seattle.

Condensed News Reports

Officers of companies are earnestly requested to forward us promptly all financial and other statements as soon as issued and any items of interest as to their plants and systems

PERSONAL.

A. J. GIBSON has been made manager of the Bell Telephone Company's exchange at Alton, Ill.

PAUL MILLER, manager of the Marion and Northern Telephone Company of Clintonville, Wis., has resigned to take up work in Montana.

W. G. OLWIN, manager of the Interstate Telephone & Telegraph Company's exchange at Peoria, Illinois, has resigned his position to take up another line of work. He is succeeded by C. F. Hixon, who was his assistant.

CHAS, GUERNSEY, who for four years managed the plant of the Scott County Telephone Company at Scottsburg, Indiana, has resigned that position to take a similar position with the Eden Mutual Telephone Company at Schaller, Iowa.

J. S. WILEY, auditor of the Bell Telephone Company of Pennsylvania, of Philadelphia, has been appointed assistant comptroller of the American Telephone and Telegraph Company, with headquarters in New York City, N. Y. Martin H. Bushler, manager of the Pittsburg exchange of the Bell company succeeds him.

OBITUARY.

ALONZA D. BAKER, president of the Livingston Rural Telephone Company of Dalton, N. Y., died on April 1.

GEORGE GRIFFITH STEEL, publicity manager of the Bell Telephone Company of Pennsylvania, died April 11, 1910. The part of Mr. Steel's work which made him generally known among Bell telephone men was his success in building up a highly useful paper, the Telephone News, circulated among employes of his company and the head offices of the Bell companies throughout the country. This paper was conducted in such a manner as to be a decidedly helpful influence for the building of better methods and encouraging and stimulating efficient work. He was highly respected and admired by his associates in the company's offices.

NEW COMPANIES.

FREEPORT, ILL. (Stephenson County).—Freeport Telephone Exchange Company, incorporated with an authorized capital stock of $50,000. Par value of shares, $100. Incorporators: Roy K. Farwell, Fred M. Gund, R. R. Tiffany.

PITTSFIELD, ILL.—Articles of incorporation have been filed with the county recorder by the Hadley and El Dara Telephone Company. The incorporators are: M. C. Brown, Owen L. Fitch, W. H. Moyer, John Reeder, W. A. Elder and H. P. Glecker.

INDIANAPOLIS, IND.—Jackson Township Telephone Company, Brazil, Ind.; capital stock, $10,000. Directors, J. H. Hoffman, Willis McCullough, George Youngbrod, C. W. Evans and Ralph Ressler.

CISNEY, KY.—The Rosewood Telephone and Telegraph Company has filed articles of incorporation. The incorporators are E. Thornberry, W. J. Jenkins and J. H. Smith.

CLARKSON, KY.—The Hickory Valley Telephone Company has ben incorporated by A. G. Burns, Jesse Whitten and R. B. Horrell.

SPRINGFIELD, KY.—The Cecil Telephone Company has been incorporated by S. M. Cecil, B. J. Cecil and W. J. Smith.

AUGUSTA, ME.—Florida Tropical Fruit Company, chartered with an authorized capital stock of $35,000. Incorporators are Lewis A. Burleigh, Augusta, Me.; E. M. Leavitt, Winthrop, Me., president and treasurer; M. F. Sheehan, Augusta, Me. The company will construct and maintain telephone lines in conjunction with its other purposes.

PORTLAND, ME. (Cumberland County).—Ihlseng Mining Company incorporated with an authorized capital stock of $400,000. Par value of shares, $10. Incorporators are: William A. MacPherson, Portland, Me., president; A. V. Mann, Portland, Me.; Albert W. Tolman, Portland, Me., treasurer., to conduct telephone system in connection with other purposes. Attorney incorporating, Ernest E. Noble of Portland, Me.

PORTLAND, ME. (Cumberland Co.)—The Kansas Railway and Light Company chartered with an authorized capital stock of $1,500,000; par value of shares, $100. Incorporators are Edward Woodman, Portland, Me., treasurer; J. H. McLellan, Portland, Me., president; J. A. Voter, Portland, Me.; W. B. McKinley, Champaign, Ill.; E. A. MacNutt, Montreal, Quebec. The company will construct telephone lines in addition to its other purposes.

PORTLAND, ME. (Cumberland County).—Ray Coalition Copper Company incorporated with an authorized capital stock of $3,000.000. Incorporators are: Frank E. Wallace, New York City; Holmes V. M. Dennis, Jr., New York City; Daniel F. Yost, New York City, president and treasurer; A. F. Dunham, Portland, Me.; M. S. Wells, Portland, Me. Attorneys incorporating, Verrill, Hale & Booth of Portland, Me.

CURTIS, NEB. (Frontier Co.)—The North Star, Sheridan and Curtis Telephone Company has been chartered by the secretary of state with an authorized capital stock of $10,000. C. E. Brown, W. J. Johnston, F. H. Hecht and R. A. Wilson are the incorporators.

HENDLEY, NEB.—The Hendley Switchboard Company has been incorporated and chartered by the secretary of state. Authorized capital stock is $3,000, par value of shares $100. Incorporators are E. R. Kirste, J. H. Adams and J. O. Henry.

SPALDING, NEB., Greely County.—The Spalding Telephone Company is a newly incorporated company with an authorized capital stock of $10,000; par value of shares, $25. Incorporators are: Gus Lichtenberg, F. J. O'Hara, J. H. Brownlee and G. N. Anderson.

NAVARINO, N. Y. (Onondaga Co.)—Navarino Telephone Company, chartered with an authorized capital stock of $5,000; par value of shares, $50. Incorporators are, N. E. Mear, W. C. Fisher, Frank Case, Fred Kingon, Irving Rathbun, William B. Tucker and B. C. Goennell, all of Navarino, N. Y.

OLEAN, N. Y.—An Independent telephone company has been formed at Great Valley, with a capital stock of $3,000, to build and operate a telephone system throughout the town. The officers are: E. L. Bonseel, president; Wm. S. Morton, vice-president; H. C. Whitlock, secretary and treasurer; G. L. Folts, purchasing agent; C. F. Hess, auditor. The directors are Wm. H. Folts, Miles Burger, C. F. Hess, G. L. Folts, Wm. S. Morton, E. B. Bonsteel and John McNamara.

CARRINGTON, NO. DAK. (Foster County).—The Haven Telephone Company incorporated with an authorized capital stock of $15,000. Par value of shares, $100. Incorporators are: Albert Rosenau, P. C. Peterson, R. S. McIntyre, all of Carrington.

ARCHERS FORK, OHIO (Washington County)—The Garby-Cady Telephone Company has been incorporated with an authorized capital stock of $10,000; par value of shares, $50. Incorporators are John Taylor, J. A. Stewart, C. W. Youngaley, C. W. Lenington, J. F. Taylor and M. D. Kline, all of Marietta.

HUDSON, OHIO (Summit County)—The Hudson Telephone Company has been incorporated with an authorized capital stock of $30,000; par value of shares, $50. Clifford A. Neff, Walter S. Lister, Wm. C. Rhodes, R. A. White, Max E. Meisel, all of Cleveland, are the incorporators.

CENTERVILLE, OKLA. (Kiowa County).—The Mountain Park and Centerville Telephone Company incorporated with an authorized stock of $1,000. Par value of shares, $20. Incorporators are and place of residence: C. O. Evans, Mountain Park; G. R. Wimberley, Mountain Park; J. T. Hargrove, Mountain Park; C. O. Vestal, Roosevelt, Okla.; W. M. Mobry, Roosevelt, Okla.

MACLEAY, ORE.—The Lewisburg Mutual Telephone Company has been chartered by the secretary of state. The company is capitalized at $1,175, par value of shares, $23. The incorporators are Ernest Brown, G. H. Thompson and W. J. Harberly.

MOUNT ANGEL, ORE. (Marion County)—Mount Angel Telephone Company was just chartered with an authorized capital stock of $5,000. Par value of shares, $25. C. R. Hougham, Henry Klinger, G. D. Ebner, al of Mt. Angel, are the incorporators. Attorney incorporating is J. C. Siegmund, Salem, Ore.

TOLEDO, ORE. (Lincoln Co.)—The Lincoln County Telephone and Telegraph Company has been chartered by the secretary of state with an authorized capital stock of $10,000, par value of shares, $10. The incorporators are W. K. Merrill and R. F. Patton, Oregon, and R. B. Walls, of Toledo.

COLUMBIA, S. C.—The Summerton Telephone Company of Sumter was commissioned with $2,500 capital. H. J. Harby, Robert Shelor, G. A. Lemmon and I. C. Strauss.

JAVA, S. DAK. (Walwarth Co.)—South Spring Lake Telephone Company, chartered with an authorized capital stock of $2,000; par value of shares, $65.00. Incorporators are J. C. Cratton, Geo. W. Ryan, P. J. Samuelson.

NASHVILLE, TENN.—Watertown Home Telephone Company of Wilson County has been incorporated with a capital stock of $5,695. The incorporators are A. C. Philips, C. C. Davis, E. P. Jennings, J. H. Payne, T. W. Moore, T. L. Blaird, J. F. Johnson, Andrew Williams and Robert Patton.

NASHVILLE, TENN.—A charter was issued by Secretary of State to the Brazil Telephone Company of Gibson County. The purpose of the company is to manufacture electricity for telephone purposes and for equiping and maintaining telephone lines and exchanges and for doing a general telephone business. The authorized capital stock is placed at $2,000. Those signing the

application are J. T. Allen, J. W. Hunt, D. M. Dinwiddie, J. M. Harris, Walker Derr, W. J. Barker and W. F. Matthews.

FINANCIAL.

GRAND RAPIDS, MICH.—At the regular monthly meeting of the directors of the Citizens' Telephone Company the quarterly dividend was declared, being the 51st. The reports were very encouraging. A net gain of 415 new telephones was reported for the past four months. The Lansing exchange, operated by the same company, has had a growth of 300 during the past six months.

SPOKANE, WASH.—The Washington Southern Telephon Company has increased its capital stock from $100,000 to $700,000. It is planned to extend the system of this company through to the coast, and exchanges are now being built along the route to be followed, and it is quite possible that the company will enter Portland, Ore. The directors of the company are: Chas. M. Cooley, D. V. Cushman, Chas. R. Cushman and W. H. Walthers, of Spokane, and Fred Hamse, of Burlington, Vt. This company operates to the limits of Spokane and connection is made over the lines of the Home company.

WELLSBURG, W. VA.—At a recent meeting of the stockholders of the Wellsburg Home Telephone Company, the regular quarterly dividend of 1½ percent was declared payable.

CONSTRUCTION.

LODI, CALIF.—Farmers living in the district for six miles west of Lodi and Woodbridge have organized the Roseberry Rural Telephone Company. Lines will be constructed for the use of the farmers in this district, extending from Roseberry Place to Lodi. The following officers were elected: L. J. Lucas, president; J. E. Stewart, secretary; J. H. Sollinger, treasurer.

MINOK, ILL.—The Minok Telephone Company has commenced the erection of a modern, two-story exchange building.

AUBURN, IND.—The Home Telephone Company will soon commence the construction of a new exchange and office building, and new exchange equipment will be installed. W. L. Straus is general manager of the company.

LAGRANGE, IND.—The Northern Indiana and Southern Michigan Telegraph and Cable Company are making arrangements to install a telephone system in Lagrange.

MONTICELLO, IND.—The Monticello Telephone Company has let the contract for the construction of a new exchange and office building. The building will be fireproof, of brick, 56x90 feet, two stories in height. The company will install new exchange equipment.

JEWELL, IA.—The outside plant of the Jewel Telephone Company is to be entirely rebuilt by the company. In the downtown section cables will be strung, and the entire system will be made metallic and exposed wire will be replaced by copper clad steel wire.

JUNCTION CITY, KANS.—The Wareham-Dewey Telephone Company has applied to the city officials for a franchise which will give them additional privileges, and asked for permission to raise the rates 50c per month. It is the desire of the company to install a modern common battery system in place of the one now in use. The company also expects to erect a new exchange building within a short time. It is estimated that the improvements will cost the company in the neighborhood of $50,000.

SALINA, KANS.—The Home Telephone and Telegraph Company, of Abilene, has men working on the extension of a new copper toll line from Salina to Ellis.

COLLY, KY.—The Letcher County Home Telephone Company announces that construction will soon be begun on a line running between Sergent and Norton, Va., giving service to Lima, Bilvia, Dewey and Guests River. The line will be 30 miles in length. E. Franklin is manager of the company.

DEFEATED CREEK, KY.—Oscar Banks is endeavoring to interest others in the construction of a telephone system in this place, also a long distance line from Defeated Creek to Banks, connecting with the Perry County Telephone Company.

PADUCAH, KY.—The Paducah Home Telephone Company is planning many improvements to be made to its system during this summer. Lines will be run connecting all the small towns in McCracken county, not already connected with the system, to the Paducah central, and long-distance lines will be run to all towns of importance in western Kentucky, and a toll line will be run to Cairo, Ill.

PINE TOP, KY.—The Carr's Fork Telephone Company is endeavoring to secure rights-of-way for the construction of a line connecting Pine Top and Bath, giving toll service to Derrick. At Bath the lines will connect with those of the Perry County Telephone Company.

WINCHESTER, KY.—The Clark County Home Telephone Company intends installing new exchange equipment and making other improvements to its system.

WHITESBURG, KY.—The Whitesburg Telephone Company will install a new switchboard in its Whitesburg exchange and also in the Eolia exchange. James P. Lewis is manager of the company. This company is endeavoring to give its subscribers the best of service.

ZEELAND, MICH.—The Borculo Independent Telephone Company, working in conjunction with the Zeeland exchange, is doing very well. Twenty subscribers have been secured, and it is probable that more will be added rapidly.

MOUND CITY, MO.—The Independent Telephone Company, of Craig, have material on the grounds for the construction of telephones lines connecting Craig and Oregon, via Mound City.

ALBUQUERQUE, N. M.—Telephone lines are being constructed by the government from Santa Fe to Glorieta, and from Glorieta to Panchauela on the Pecos, to give service to the Supervisors of the National Forests.

BELLINGHAM, WASH.- The Home Automatic Telephone Company will soon begin the construction of a toll line connecting Bellingham and Seattle. The cost is estimated at $15,000. Earl Knight is local manager of the company.

ELECTIONS.

WILLIMANTIC, ME.—The stockholders of the Willimantic Telephone Company elected the following officers for the ensuing year: E. L. Knowles, president; Leslie Knowles, vice-president and treasurer, and Sumner Hart, secretary.

ADDISON, N. Y.—At a meeting of the stockholders of the Addison & Bath Telephone Company, held at Goodhue Lake, the following officers were elected for the ensuing year: President, G. D. Wilbur; secretary, F. Chapell; treasurer, John Little. The company has a balance in its treasury of $222.27.

BLOOMSBURG, PA.—C. E. Kreischer, Cattawissa; E. H. Shulz, Mayberry Twp., and J. E. Kase, Elysburg, were elected as directors of the Farmers United Telephone Company.

BANCROFT, S. D.—The annual meeting of the stockholders of the Bancroft-Manchester Telephone Company, which operates telephone lines in the rural districts, was held and as a result of the election held the following will serve during the ensuing year: J. B. McAllister, president; F. E. Evans, secretary, and O. S. Hoover, treasurer.

MISCELLANEOUS.

BAY MINETTE, ALA.—The Alabama Telephone and Telegraph Company, a new organization perfected at Robertsdale, will erect a trunk line from Robertsdale to Galesburg, and from there to Seminole and Summerdale. Officers of the new company are: Willis L. Mumna, president; Spaulding Peck, secretary and treasurer. Directors, W. S. Harvey, J. H. Haswell and T. G. Kidwell.

OWENSBORO, KY.—The Kentucky and Indiana Telephone Company, which recently went into bankruptcy, has been reorganized under the name of the Owensboro Telephone and Telegraph Company. The company has a capital stock of $10,000, and its indebtedness is limited to $250,000. Stockholders include Joshua D. Powers and Samuel L. Heller of Louisville, and some Toledo capitalists whose names have not been given out.

ANACONDA, MONT.—The Montana Independent Telephone Company has just received a shipment of 300 telephones, of which number 100 will be installed in the Butte Hotel, which has been equipped with a private branch exchange.

TROY, N. Y.—Reports of the Commercial Union Telephone Company show a gain of 59 telephones in Watervliet and a gain of 79 in Troy for the month of March. The apparatus to be installed in the Glens Falls exchange has been received, and will be installed promptly.

JACKSON, TENN.—The Sun Telephone and Telegraph Company, of which Terry W. Allen is president, has purchased the holdings of the Stantonville Telephone Company in Tennessee. It is reported that the sale of the Stantonville company's property in Tennessee to the Sun company, will in no way effect the Stantonville Telephone Company in the states Mississippi and Alabama, of which Mr. Allen is also president.

WELLSBURG, W. VA.—The Wellsburg Home Telephone Company has purchased that portion of the Chartiers Telephone Company's lines in West Virginia, heretofore operated by the Union Construction Company.

The Wellsburg company recently finished rebuilding its entire plant, changing from common return to full metallic, copper circuits. The list of subscribers has increased 70 per cent, and is still growing rapidly.

VERMILION, ALBERTA, CAN.—E. Tomkin and R. A. Wilson were appointed as a committee to look into the matter of building a telephone line, giving service to this town, at a recent meeting of citizens of the town.

LUMSDEN, CAN.—A telephone line will be constructed from Lumsden out among the farmers, to Lumsden Beech.

WINNIPEG, MAN., CAN.—Tenders will be received by the Chairman of Board of Control for the supply of insulated line wire and mast arm parts, tenders to be received not later than April 30.

UNDERGROUND.

NEWPORT, KY.—The Citizens Telephone Company has men at work laying wires of the company in the business section of the city in underground conduit.

LEWISTON, MONT.—The Farmers' Mutual Telephone Company is placing all its wires in the business district of the city underground.

WEST CHESTER, PA.—The American Union Telephone Company has requested permission of the city authorities to install wires along certain streets in the city, in underground conduit.